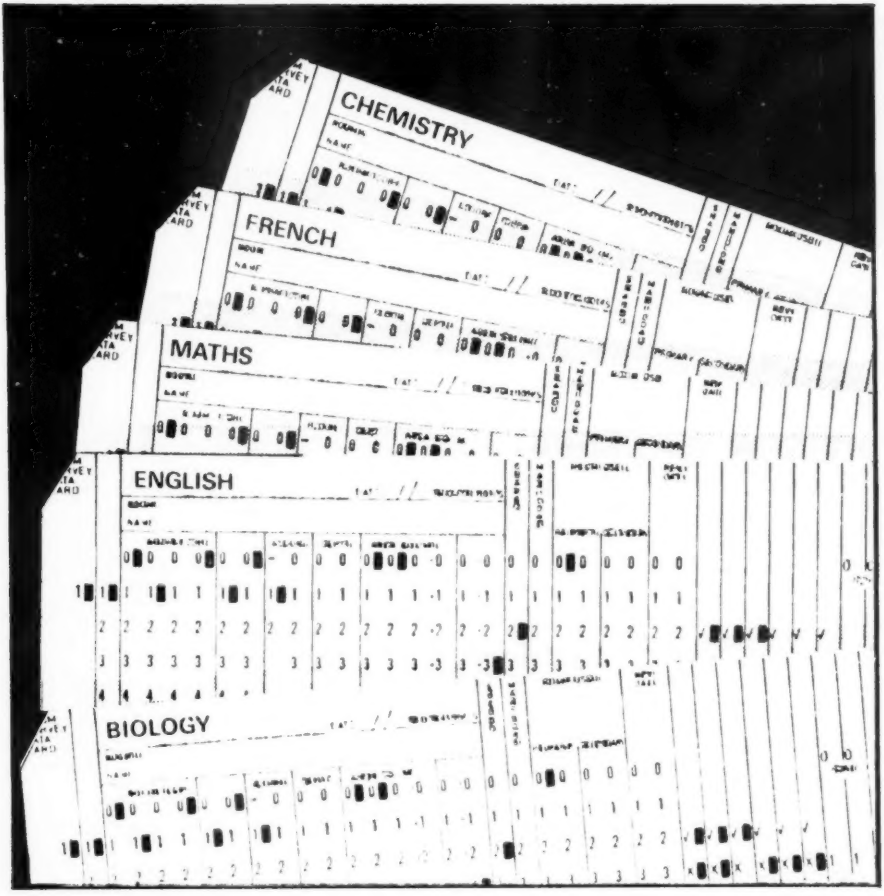
Trends in Education



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October 1974

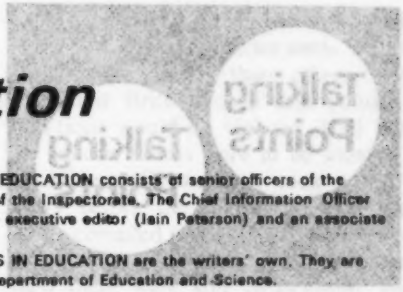
CHANGES IN THE CURRICULUM

Timetabling by Computer

How Parents can help Primary School Learning

FE Achievements

Trends in Education



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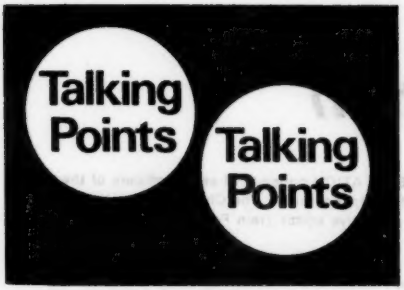

Candid Friends

For some time now, the Society of Friends has viewed with concern (to use an old Quaker word) the steady decline in the number of Quaker children in its schools. Accordingly, the Friends Schools Joint Committee set up a working party to consider the relationship between the Society and the schools carried on under its care and in its name. The report of that working party* was published towards the end of last year. It is an interesting document because it contains a concise account of the ways in which social changes are affecting a particular kind of residential education, an account that ranges wider than the immediate problems facing Quaker schools.

'In the course of their history', the report comments, 'Friends' Schools, along with other boarding schools, developed a distinctive philosophy of some merit regarding the reconciliation of the claims of the individual with the needs of the community . . . Since the war, opinion has altered somewhat and there has been much discussion among Friends as well as others as to whether a boarding school education is, in fact, desirable at all'. The report also points out that there has been in recent years a steady decline in the demand among middle and upper class parents for boarding school education for its own sake, but that places are increasingly being taken up by local authorities or by the children of parents living abroad who work for organizations such as the EEC. This is one of the main reasons for the increasing secularization of Quaker schools.

Another trend the working party noted is the growing divergence between the values and conventions of the school and the values and conventions of the home. 'The pupils', the report goes on to say, 'had a framework which gave security to them even though they challenged the structure as they grew towards maturity. The system was maintained by a hierarchical school government, which could be liberal and enlightened, but expected and enforced obedience. In the past decade, this structure of school life has become eroded because, in many instances, it has appeared to be out of step with society at large'. The authors of the report see this not as a regrettable change caused by permissiveness but as a natural result of the kind of education that encourages young people to think for themselves and show initiative.

With that characteristic Quaker aptitude for taking the balanced view, the report gently chides those who 'adopt an unwise rigidity' in opposing the efforts young people make to change society and those who 'have encouraged them to challenge all authority simply because it is authority'. The report sees the major problem as being ambivalence rather than permissiveness, an inability of society to decide what attitude it should adopt in particular circumstances, an intellectual and moral indecisiveness. Parents, it points out, often want the school to maintain a form of discipline they themselves no longer practise. Even within the Society itself there is now a wide range of opinion and practice, and the schools are no longer in a position to reflect a consensus of belief because no such consensus now exists.

The report discusses not only the social problems Quaker schools face,

* Friends' schools in the seventies. The report of a working party of Friends Schools Joint Committee. London, 1973.

but also their administration, their curriculum, their relations with the maintained system, and their possible future role within the Society and apart from it. It is an absorbing document, but where it is at its most interesting is where it reveals the dilemma of an organization with a long-standing commitment to a particular kind of education faced with a situation in which one of the main principles on which that type of education is based has been called in question.

What should be learned?

Children go to school, for the most part willingly, and all societies seem to believe that they profit from the experience. There are, of course, dissident opinions, but everywhere schools rest on a consensus of belief that they benefit children and society in various ways. It is generally believed that in schools learning takes place, so it is considered right and proper that assessment of learning achievement should be part of the school system. Thus a substantial industry has come into existence charged with framing and conducting examinations. In this country a parallel structure exists with responsibility for studying the content of education. Changes occur in the practice of assessing pupils' learning performance. There are parallel changes in the rating of traditional and new elements in the curriculum. The content of learning, like the children's attainment, is under constant examination. In this operation teachers themselves play an enormous part; so do those who train and advise teachers; so do administrators; so do parents, pressure groups, publishers and professional associations.

At bottom, the rules governing examinations are based on a concept of fairness. A moral tradition is involved and the practice of scientific rationality is observed. If they were not, members of the public would soon be very angry. Every hand is raised against corrupt examination procedures and every voice deserves a say in the content of the curriculum. In practice some voices have a bigger say than others, but important British social and political traditions would be violated if all but the loudest voices were to be silenced. In Hitler's Germany it took several years before the teaching force was safely corralled in the National Socialist Teachers' Union (NSLB), and even then there were still recalcitrants for Goebbels and Schirach to worry about.

In an open society the tendency is for teachers to take an ideological view of what should be learned and for others, pupils, parents and pressure groups, to take an instrumental view. The outcome of the resultant conflicts ought always to be a compromise, and the duty of government is to insist that this should be so. Such insistence, however, is not easily applied at any stage of education; it becomes more and more difficult as the pupils' studies grow increasingly complex. Complexity and sophistication in modern secondary education seem inseparably bound up with social and economic determinants.

There are, however, stages in education where such pressures have been progressively weakened. Why have English primary schools earned high regard in the world? Principally, we suggest, because they are conducted in accordance with teachers' perceptions of children's needs, interests and stages of development. Schools give children varied and interesting experiences not otherwise attainable; fruitful types of activity are stimulated; physical, emotional and intellectual energies are fostered and channelled into achievements; simple skills are mastered; the foundations of social responsibility are laid; the process of learning to think in a disciplined manner begins. It has been useful that philosophers—for instance P. S. Wilson in *Interest and Discipline in Education*[1]—should have

[1] WILSON, P. S. *Interest and discipline in education*. London: Routledge & Kegan Paul, 1971.

shown us that good intentions can lead on to logically treacherous ground when needs and interests are used as direction-finders.

Children's need is not the *logos*, the last word or the only Word. The things children are interested in do not give us a complete answer to the question of what they should learn. Good teaching and plentiful learning occurred in our society long before Piaget indentified his stages of childhood development. Yet in spite of these, and other, criticisms and anxieties, it is the secondary stage of education, not the primary, that causes most concern.

At this point the term curriculum is commonly used, and its nature—whether it be balanced, progressive, relevant, integrated and so forth is discussed. Social pressures of various kinds are imposed; amongst others, employers and trade unions are concerned about what is learned. The recipient of education has now a larger say. Pupils increasingly choose their subjects of study and neglect those to which they attach little importance. The ideological view that science, religion or history, for instance, *must* be incorporated in all curricula is influential but not paramount. Both the styles and the content of learning emerge as a compromise between tradition and innovation.

Is not the distinction drawn by many teachers not so much between the new learning and the old, as between what is learned for its own sake (new or old) and what is learned because it has value within the society whose purposes education is said to serve? Society as a whole will always tend to value the teaching of its children for what it may produce at some time and place other than the school or college. A parent may see this as the grammar school, the university, the 'good job'. For the pupil and the teacher the picture is never quite like this, and in a successful primary school never like this at all. Payment by results has gone and the 11+ examinaion is disappearing. Children learn not only that it is in their interests to learn, but that learning is in itself interesting. As long as schools convey experience, pleasurable in some ways and at some times, so there will be children who come willingly to school and teachers secure in the knowledge that what they do is worth while. A teacher is at his best with what he knows how to teach and what he believes it to be right that he should teach. Society may promulgate its aspirations or even its directives but can supply no real answer to the question we are asking. The knowledge possessed by teachers, their insight into children's ways, the educational values they have absorbed—these are the factors that count.

Changes in the curriculum

Subject-centred? Child-centred? Interdisciplinary? What should children learn? What should teachers teach? The answers to these questions lie at the heart of curriculum planning. Yet what is 'the curriculum'? Where do its boundaries begin and end? Can they be clearly defined? When we speak of 'extra-curricular' activities, we seem to be implying that we know exactly where the boundaries lie. The curriculum is not just the syllabus, though it includes it. It is not confined to that which is formally taught, though it includes that too. In fact, 'curriculum', like poetry, is very difficult to define but easily recognizable when one sees it.

The articles in this issue of TRENDS cover almost the entire spectrum of education from the primary school to the further education college. They include not only curriculum theory but curriculum practice. We hope that these articles will further the debate and help to provide some of the answers to at least some of the questions with which we began.

Links between subjects

B. W. KAY

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In deciding on an appropriate title for this article, I ruled out the obvious possibilities, 'integrated studies', 'interdisciplinary studies' and the like, because such terms have been used in so many different significances that their meaning has become blurred. The present title has the advantage that it lays no spurious claim to precision, but it does suffer from the explicit admission of the primacy of subjects—a primacy that not all advocates of 'integration' would necessarily accept. But perhaps such an admission is not a bad starting point; after all, the curriculum of most secondary schools still consists largely of subjects, and the training of the great majority of present teachers was subject-based. Subjects may not be the ideal point of departure towards a more homogeneous curriculum, but they are the point from which, in fact, we must depart, if we are to make that particular journey, at any rate within the context of the secondary school.

Once it is established that subjects must be our starting point, then it is possible to recognize that the variety of links between them can be described in the form of a sort of taxonomy. At one extreme we may find that some subjects disappear entirely as autonomous elements from the curriculum, either permanently or for a period of two or three years, and that their place is taken by a single 'integrated' study, which may be labelled 'humanities' or

'environmental studies' or 'European studies' or 'man and society' or a combination of these or many other titles. At the other end of the spectrum may be the situation where subjects continue to exist separately within the curriculum, but only after the formulation of a general curriculum policy for the school which has involved an analysis of each subject's contribution at each stage of the pupil's school life to the general curriculum objectives. In between these, many intermediate degrees of linkage may be identified of which the following may offer examples:

1. The continued existence of subjects separately and in their own right, side by side with their participation in integrated programmes on a long- or short-term basis.
2. Planned combinations of subjects on an occasional basis, e.g. for the common exploration of a theme. Different subjects may be grouped together at different times, and the themes and thus the groupings of subjects may be planned over successive terms of years according to an overall curricular policy.
3. General studies programmes (not necessarily restricted to the sixth form) which are genuinely planned to relate the different contributions of a range of subjects to a single scheme.
4. Occasional or episodic coincidences of interest in two or more subjects; these may be in response to a burning local issue or an event of wider significance, and may result in joint work over a longer or shorter period.
5. The identification of shared objectives leading to parallel work in two or more subjects (e.g. mathematics and art in work on symmetry).
6. 'New' areas of the curriculum which do not necessarily exist in timetable terms but which affect the content or emphasis within several subjects e.g. health and moral education).
7. Expansion in the field of interest of one subject, which calls upon 'servicing' elements of other subjects e.g. music may enlist the help of handicraft for the making of musical instruments).
8. Expansion of subject areas beyond their traditional limits, not necessarily calling upon expertise from other subjects but with implications for other subjects and depending to some extent on associated developments in those other subjects.
9. The collaboration of subjects kept apart within the curriculum in the activities of out-of-school clubs and societies.

Problems of Organization

Any form of linkage between subjects creates problems. If it is decided to plan within the timetable for joint working, whether by setting up a faculty organization, or simply by grouping subjects together on the timetable, then the danger is on the one hand that the gulf between faculties may prove to be even wider than the gap between subjects, and on the other hand that subjects may become 'typecast' according to the place assigned to them within the structure; geography may come to be linked inevitably with history and isolated from the sciences, classics may be contained within either the language or the humanities area despite its role in both contexts. If a flexibility of grouping can be preserved within the faculty organization, so that faculties do not necessarily contain the same constituent subjects from year to year, then these disadvantages can be avoided. But too often faculties become part of the administrative structure and so lose the flexibility that they might otherwise have.

If, on the other hand, linkages depend on accidental and occasional opportunity, then a tension is set up between the needs of a flexible teaching approach, and a timetable which even at its least inflexible still exercises a massive constraint upon the exploitation of the happy accident or the golden opportunity. The suspension of the timetable from time to time to enable a different form of working to take place seems a desirable arrangement; schools often associate such a suspension with a period of residence at a field centre. The abolition of the timetable may prove to be a Draconian solution which achieves freedom only at the cost of the loss of that order and rhythm of working which suits most pupils and teachers for most of the time.

Personality problems

If organizational problems loom large in the planning of linked courses, problems of personality are scarcely less intractable. While the accident of compatibility or temperament amongst staff cannot be elevated into a principle by which the possibility or nature of joint work should be determined, it is no less certain that 'integration' succeeds or fails as much because of the relationships of the staff involved as of its intrinsic educational values. For instance, the undue dominance of a member of staff or of a department can lead to concentration on one or two areas of study and the corresponding neglect of others. The choice of 'topics' for combined work sometimes betrays such an imbalance, with the undesirable result that some members of a team are scratching round miserably for the few husks that their subject can marginally contribute to the topic, while others enjoy an embarrassment of riches.

Any form of curricular development by the full-time practising teacher is enormously demanding of time and mental energy; curricular development which crosses subject boundaries and involves the teacher in a dialogue with other disciplines makes greater and more varied demands than most. It also offers greater potential rewards in the broadening and enrichment of the teacher's own experience. Attempts to work beyond the confines of subject boundaries underline the need for in-service training, whether to help teachers find a new role in the classroom, to learn new skills in the creation and use of resource material and to master new forms of recording and assessment, or to give opportunities for the thorough analysis of curricular aims without which interdisciplinary courses are likely to be lacking in direction. They can also prove a very potent source of in-service training within schools, as teachers are exposed to a creative dialogue with their peers in which traditional assumptions within subjects are challenged and the validity of different attitudes and modes of thinking is demonstrated.

The choice of topic, or the range of topics made available for pupils to choose from, is of vital importance. The fact that a topic

can interest a given group of pupils, while a useful concomitant, is hardly an adequate criterion for selection. Themes should surely be significant, and, what is more, should be geared to the objectives of the curriculum as a whole. Their contribution may be defined in terms of attitudes acquired, skills learnt or knowledge gained (an objective as commonly undervalued now as it was once obsessively sought after). It could well be that the theme should determine the team that is to teach it, rather than that a team of teachers should seek a theme which is acceptable to all. The latter is more likely to lead to the triviality of the pursuit of a highest common factor.

In defining aims in interdisciplinary studies, there is an especial danger of confusing objectives and methods. It is sometimes quite rightly stated that in adult life very few problems can be solved except by the application of the methods of several different disciplines, and that pupils should be made capable of embarking upon such a cross-disciplinary approach. Less secure is the deduction that pupils should be put into the position of applying a multi-disciplinary approach to problem-solving. This is by no means proven. It may well be that an equally valid method would be that of ensuring that children are trained to use the several tools supplied by subject disciplines to as high a level of proficiency as possible by practising them separately before attempting to bring them all to bear on a single issue. The best way of learning how to solve complex problems may or may not be by practising solving simple problems.

Much of what has so far been said in this article has been negative in form. The aim has been to highlight some of the difficulties which must be faced if interdisciplinary studies are to be introduced into the secondary school. The remainder attempts a more positive approach.

Discipline and interdiscipline

The term 'integrated' appears to convey the implication that (a) there are a number of separate ways of pursuing knowledge, (b) they can be united into a single overall approach, and that (a) precedes (b). It might be more profitable indeed to speak of the subject-based curriculum as 'disintegrated' studies, since subjects are an unnatural division of experience into areas which are not so neatly self-contained as might appear. When a group of observant children walk along a canal bank, their experience may in part be appropriate to the techniques of the biologist, the geographer and the historian, and the subject matter of their experience may be more or less divisible into areas to which each of these disciplines would lay claim; the way in which they react to their experience may be of interest to the specialist in art and craft or drama or English or music. At an early stage of sophistication these specialisms may be applied at so superficial a level that the process is largely unconscious; if they are carried further, then it

becomes necessary to call upon the skill and knowledge of the specialist. Even at an early stage opportunities can be exploited, deeper interest developed and frustrations avoided, if the teacher can contribute a knowledge of the disciplines concerned. The response to a pupil's question, 'I don't know, but let us find out together', is only a helpful one if it is at any rate in part a pose, if the teacher has a very good notion of at least how to find out, if not of the answer itself. Few educational situations are less creative than that in which pupil and teacher are both floundering for the want of a simple incisive question or statement, or for the lack of an essential piece of information. This all leads to the conclusion that if experience-based education is, from the outlook of the child, an undifferentiated whole, it is, from the point of view of the teacher, the field in which a number of specialisms meet.

Sooner or later, if the pupil is not to remain over-dependent on the teacher's expertise, he must develop some skills in handling the ideas, vocabulary and techniques of 'subjects'. There is little disagreement about this need for skills, but more about the way they should be acquired and the stage at which the acquisition should become an explicit objective within the school curriculum. No longer does training in subjects begin automatically at the beginning of the secondary stage, and yet many teachers believe on the one hand that the acquisition of subject skills ought not to be postponed far beyond that stage, and on the other that subject teaching provides the best context for it. There is no reason why adequate practice in all the skills necessary to the pupil should not be built into an interdisciplinary course, but if this is to be achieved, there is need for a more sophisticated analysis of objectives, a more structured planning of the individual pupil's programme, and a closer monitoring of his development than is usually to be found.

If integration is the natural state, 'disintegration' the unnatural, one would expect integrated work to be particularly appropriate to the needs of less mature pupils. In so far as the more mature and more intelligent pupils can more easily manipulate abstractions while the less mature and less intelligent are more dependent upon practical experience, the former will be more at home within subjects which are themselves abstractions from experience. An experience-centred pattern of work, necessary for the less mature, demands integration. Hence it is probably sound intuition that has tended to bring in integrated work at the lower end of the secondary school, as a continuation of primary practice, and among the less able older pupils.

There is one other part of the school in which 'integrated studies' are frequently to be found—the 'general studies' part of the sixth form programme. This is regarded in a few schools as the nucleus of sixth form work, while subjects studied for Advanced level are simply explorations in depth of some of its aspects. Sometimes, less radically, it is an attempt to explore some relation-

ships between subjects. More often it is simply the plugging of gaps, an attempt to encroach upon some of the wide areas of ignorance left between the boundaries of traditional subjects. The first two represent a further stage in the 'integration-disintegration' process, 'synthesis'. Having left behind an earlier and simpler unity of understanding as he proceeds further along the different disciplines, a sixth form pupil can be helped to synthesize from the ingredients of his knowledge. In English he studies Milton's *Lycidas*. In Classics he has read Virgil's *Bucolics* and Theocritus' *Idylls* (the latter perhaps in translation). He can now associate all these and follow up the links which connect them to European literature and which lead on to Keats and Shelley. This process depends on having studied subjects to some depth before the unifying elements can be fully understood. At this stage too he can apply the knowledge and skills he has gained in, say, history, economics, geography and the other sciences to the study of complex problems of our time like that of population control or environmental pollution. These imply considerable resources of knowledge as well as an ability to see relationships and to assess their significance—a very different level of 'integration' from that described earlier.

Conclusions

Bearing in mind both the number of different forms of subject linkage and the cautions expressed in the earlier part of this article, and accepting for the moment a validity of the integration-disintegration-synthesis hypothesis on which the second half is based, what conclusions, however tentative, might be drawn? First, that we are talking, not of one easily defined educational activity, but of a range of educational activities most of which present us with new problems that must be solved if they are to be successful. Second, that despite these difficulties there seem to be two stages, at the beginning and the end of the secondary school, where there is room for close links between subjects, but the term 'integration' will mean something essentially different in either case. In between these two stages, links between subjects may well need to stop short of any infringement of their essential autonomy. Third, that at the first of these two stages the main ground for developing links between subjects will most often be the desire to pursue a field of study which is confused, complex and undifferentiated—in other words, something akin to the pupils' own direct experiences. Fourth, that in the first of the two stages pupils working in interdisciplinary fields will need to rest heavily upon the subject expertise of teachers; the second stage cannot be reached until the pupils themselves have achieved a high degree of knowledge and experience within subjects themselves. Fifth, that closer links between subjects, while making greater demand upon teachers, can also contribute greatly to their personal development and professional expertise.

Secondary mathematics today

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The last 12 years have been years of great change in mathematics in secondary schools, both in content and style of teaching, and it is appropriate to consider what has been achieved, what has been missed and what are the problems in the immediate future. It is not only in England that change has been taking place. Change is world-wide, and awareness of the extensive changes which were being planned in other countries was one factor which promoted the numerous reforming movements in England in the early sixties. But it is a great mistake to apply general criticisms of happenings in other countries to English events, because English changes have had their own pattern, and what has happened here is atypical in a number of respects. In England there is no one thing which can be called 'new' or 'modern' mathematics; and if any schools or institutions claim to be doing something with such a name, only by looking at the details is it possible to learn what they understand by that name.

It is a practical convenience to classify what happens in the classroom under the headings of *content* and *method*, and recent years have seen developments in both. The projects of the early sixties had more to do with changing the content of the curriculum than with changing teaching methods. Also, it was taken for granted that changes would take place within the general examination framework then existing. But changes in teaching methods were also being considered, often by groups of teachers who were less formally organized than the teams that wrote the projects. Everyone was then overtaken by administrative reorganization, and it is this factor as much as any other which accounts for the changes of the last few years. This comes about because comprehensive reorganization involves many specialist teachers in the education of all children, when previously they have been involved only with the more able. These teachers find themselves facing a new range of problems—able to take very little for granted, and needing to decide their teaching aims and the organizational patterns, courses, textbooks, classroom equipment and the personal teaching style necessary to carry them out. Furthermore, many schools are now larger than schools used to be, and this accentuates the need for departmental organization and discussions of policy. Add to this the consideration that shillings and pence have gone and imperial units are of rapidly diminishing importance, and it is easy to understand that mathematics classrooms are very different places from those of, say, six years ago, and that sub-

stantial change has come about for reasons largely unconnected with the reasons which started reforms 12 years ago.

Reaction and compromise

There are some indications that we are now seeing a reaction against the mathematical reforms of the last decade, and many who are not themselves actively involved in the teaching of mathematics may wonder whether or not this is so. To this question there is no simple answer, because the changes over the last few years have meant different things to different people, and if we are to discuss reactions we need to know who is reacting against what. It is certainly not the case that schools are, in any large numbers, abandoning modern syllabuses and returning to traditional ones. In the few cases where this happens it is nearly always because a new head of department continues policies which he carried out in his previous school.

The entries for O-level examinations provide a crude indication of trends. In 1972 just under 30 per cent of the entries for O-level mathematics were for modern syllabuses. (Additional mathematics entries are not considered.) The remaining 70 per cent of the entries were very largely for syllabuses usually described as Syllabus B—that is to say, syllabuses providing a unified course in mathematics with some calculus, as opposed to a course composed of arithmetic, algebra and geometry as separate elements. The latter account now for only 10 per cent of the total entries. In 1971 the percentage of entrants on modern syllabuses was 22·5, and so the increase from 1971 to 1972 is something like 7½ per cent of the total. Looking at the programmes of work which are now being adopted in the lower years of secondary schools, we can see that this tendency may be expected to continue over the next few years.

Furthermore, various forms of compromise are to be found. In a number of cases schools which are modern in outlook agree that mistakes in emphasis were made when they adopted new syllabuses; they are now giving more attention to numerical calculation and algebraic manipulation than they did a year or two ago, and they supplement their course books with their own exercise material when they think this advisable. Such adjustments are signs of normal, healthy development. Some schools have courses which they describe as modern in outlook for the first few years, and they subsequently take a Syllabus B examination. There is no inconsistency in this. Interestingly, many schools can be found where the teachers describe the course as traditional, but where the textbooks used are described in the author's preface as 'modernized', or perhaps 'incorporating all the new topics which have proved their value'. The changes which these books have undergone may be quite considerable. On the other hand many schools with modern syllabuses are teaching the new material by methods which have been much criticized over the years. A

new syllabus is no guarantee against teaching for an examination by rote methods, or against the use of examples which are stylized, artificial and with little quality as mathematics. The only guarantee against these things is teachers with broad knowledge of the subject matter and sound human judgement.

Faced with the present situation it is easy to call for greater uniformity of syllabuses, or for a return to making sure of the basic essentials. Questioning samples of mathematics teachers on this suggests that, whereas a considerable number might wish to see greater uniformity of syllabuses (at least for children younger than those they teach themselves!), they would not wish to see this brought about by any kind of central direction. In many parts of the country discussions are taking place between primary, or middle, and secondary schools with a view to ensuring continuity of the mathematical education which the pupils receive. But if we accept the principle that greater uniformity of syllabuses for older pupils can only come about by democratic discussion, then we must also accept that in the present climate it can only come about very slowly. Indeed, it appears that any moves in this direction by our present democratic procedures will affect mathematical education for the 13–16 and 16–18 age groups far less than would the changes in the structure of the public examinations which are now being proposed. It could happen that once again major changes in mathematical education came about for non-mathematical reasons. This is not to suggest that things should be otherwise—but it is a plea that when planning the future of the mathematics curriculum mathematicians should take the larger context of educational change fully into account.

Differing on fundamentals

When it comes down to basic essentials, the issue is rather different. Teachers with long experience are by no means agreed on what *is* basic in mathematics. Differing views on the nature of man imply differing classroom practice. Ultimately it is only possible to agree on teaching methods if we are agreed on the destiny of man. A logical arrangement of the subject matter does not provide automatically an appropriate psychological approach to the pupil; neither do the priorities arising from the applications of mathematics in the adult world automatically carry conviction with the beginner, to whom this world is unfamiliar. To decide what *is* basic is the fundamental problem; and it is no solution at all to believe that our present difficulties arise because some teachers have been misguided enough not to start in the right place.

For a long time teachers have not been able to decide just how much computation is necessary, and how much should be achieved at various stages of development. This old question is now with us in a completely new form. A glance in the shop windows in the high street will show that numerical calculation can now be done by anyone who can copy type with one finger, and who knows

what calculation is required. It is this last point that calls for attention. The need for an appreciation of the significance of number is greater than ever, because we now have much greater opportunities for using numbers than before. Appreciation of the significance of number never was easy to teach; and whilst there is no general agreement that we are succeeding in teaching this any better than we did, that must still be our aim.

At one extreme rote learning alone has been discredited as a foundation for mastering the intelligent use of number—always excluding a minority of pupils who come to a good level of understanding whatever the teaching methods employed. At the other extreme recent experience confirms that exposure to environmental experience is not by itself enough to ensure the development of adequate computational skill by the general run of pupils, although over the last few years many teachers do seem to have believed that this is what they were being told. The source of this misconception is very hard to trace, but there is little doubt that the misconception has been there. Writers who have stressed the importance of adequate initial experience in the development of mathematical ideas and the use of various kinds of material, both natural and artificially contrived, have usually been at pains to stress the importance of continuing development, and the need to plan teaching carefully so that explicitly recognized mathematics will emerge.

Disquiet over the maintenance of proper standards of basic computation and uncertainty about comparisons over the years may lead to a demand for some form of monitoring of the standards of mathematical competence being achieved in schools. If this comes about we must remember that in recent years some schemes of work have been formulated with the aim of improving pupils' attitudes to mathematics, and increasing such qualities as appreciation of the social function of mathematics and the desire to continue further with it. This has sometimes been done although we have recognized that these changes might be accompanied by some short-term diminution of computational skill. Any attempt to measure gains or losses in computational efficiency should be accompanied by an equally determined attempt to assess compensating gains or losses elsewhere. Furthermore, over the next few years, electronic calculators will pass into general use. It will remain desirable for children to acquire a certain competence in manual calculation, but if we seek to measure their attainment in this and to make comparisons we should also assess their ability to make sensible use of common calculating aids.

There is no reason why proficiency is essential arithmetic should not be developed as part of a course which includes also a wide range of ideas, which are included because of their general interest, both as pure mathematics and as an aid to understanding the world about us. There is certainly time to do this. A glance at pupils' books of only a few years ago would remind us how much

time was then devoted to calculations with pounds, shillings and pence. Developing proficiency in these calculations, and the related ones with imperial units, consumed a very large amount of time indeed. There should be no difficulty in achieving competence in the decimal system and at the same time experiencing mathematics in use in a wide variety of contexts, and in developing some feeling for free enquiry into the properties of numbers, geometrical shapes, and abstract patterns of logical ideas.

When saying this it may be wise, at the same time, to warn against facile optimism. Today we are trying to introduce more and more young people to ideas which were formerly reserved for a comparative few. Some employers complain of the standards of mathematical competence of young people entering apprenticeships. We must aim to develop methods of consultation so that the teachers concerned can discuss complaints of this kind as they arise; and we must also remember that many young people who would previously have entered employment on leaving school are now proceeding to various forms of higher education. Nowadays many more students are passing O and A level, and obtaining mathematics degrees, but there is still a general shortage of mathematicians. It follows that the mathematical attainments of those entering particular areas of employment may not be what they previously were; those who before would have applied for such jobs now have greater opportunities elsewhere.

Some problems

The new teaching patterns which are arising in some schools bring problems for mathematics teachers. Many authorities are committed to forms of reorganization which embody broad educational ideals, and the teaching of mathematics has to take its place within this framework. It would be wrong to ask otherwise. Developments such as the teaching of mixed ability groups, the integration of the teaching of mathematics with other subject areas, and the adoption of various methods of self-paced learning all raise problems. We may accept the validity of the educational objectives but there are many difficulties to overcome if mathematics is to be taught within such a framework without any impairment of the pupils' performance by previously accepted criteria.

To indicate but one small issue—not so long ago it was widely believed in selective secondary schools that to maximize the mathematical performance of pupils in external examinations it was necessary to plan lessons in some detail, so that the lessons involved various modes of mental activity, combined with deliberate revision of previously taught ideas and subtle preparation for what was to come later. In many schools now this type of teaching would be impossible because of the overriding organizational pattern. There are always exceptional teachers who can achieve success in unusual circumstances, but we are still seriously short of mathematics teachers with the required qualifications and exper-

ience, and it is a double strain on the system to adapt to new teaching practices when we do not have sufficient skilled mathematics teachers in any case.

In recent years much new content has been introduced into the secondary syllabus, and there has been unnecessary controversy over 'traditional' and 'modern' topics as if these were alternatives. Let us consider some aspects of this in rather more detail. The time when teachers could reasonably be encouraged to attempt a few lessons on new topics in isolation, in order to get accustomed to the ideas and to see that they were not really so inaccessible, is now past. The present task is to show how the new ideas can clarify some of the traditional problems of mathematics, in fact to show their importance as fundamental concepts. For example, it is questionable if there is much to be gained from setting exercises on computation in unfamiliar number bases to pupils who have already grasped the concept of place value. Calculations in binary arithmetic of the kind most easily examined give little indication of the main importance of binary notation, which is not so much that arithmetic is done this way inside a computer as the fact that the binary outlook permits automatic decision-making in very many applications which a child can understand. Many topics, such as modular arithmetic, matrices, networks or sets are being introduced in a manner which is completely superficial, sometimes from the mistaken belief that to teach a name is to teach an idea. Properly handled these ideas have a contribution to make to the mathematical education of nearly all secondary school children, but it is necessary to teach them with sound progression and with an understanding of their purposes, to show that they can solve problems which are clearly important and above all to teach them in such a way as to make plain their unifying power. Today too many children are meeting an indigestible, unprogressive miscellany of topics. Properly organized, the same range of interesting ideas can be shown to derive from a small number of fundamental principles. We need to be much more certain about the underlying unity of mathematics.

Already much development work has been done on computer education. I mean by this not instruction in the skills of programme writing but the development of an understanding of what computers can and cannot do, why they are important and how they will affect our lives. This will play an increasing part in the curriculum and we may expect changes in emphasis as facilities become increasingly available, with less teaching *about* computers and more actual use *of* computers in a variety of educational ways. Until quite recently the use of computers in schools was largely, although by no means exclusively, restricted to mathematics. This is changing rapidly; but as computer packages become available for use in other areas of the curriculum, it will be essential to take all possible care to achieve standards of quality in the work which

will command the respect of those who have been teaching in these areas for some time.

Rethinking the aims

The teaching of statistics has grown steadily over recent years and the time may now have come when a determined rethinking is necessary. We must provide better resources, perhaps in the form of realistic case studies and suggestions for school-based enquiries which go beyond the assiduous collection of data. In practice, statistics are collected as a basis for action, and the teaching of statistics in schools might show in much more detail how the collection of data and the use of the ideas of probability enable decisions to be made.

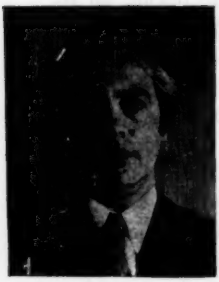
Each generation of mathematics teachers has to decide on its aims, and to shape its teaching accordingly. When teachers base their choice of material only on the unthinking acceptance of other people's aims, too often the insight is lacking to realize even these secondhand aims effectively. It is possible to maintain that for many children the school mathematics curriculum should attempt no more than the mathematics which will concern them in their own lives. In times when ideas change so rapidly it is not easy even on this basis to plan for the future. But the rest of the school curriculum is not based on such restricted vocational premises; the intention is to offer the pupil the maximum opportunity to understand the world and his fellow men. The implications of this for the teaching of mathematics are clear. It would be mistaken to restrict the syllabus to utilitarian calculations even if we knew what these were going to be over the next few decades.

It is right for schools to aspire to teach far more than just those parts of mathematics which the pupils are likely to find of direct use in their later employment and everyday life. The justification for this is that education aims to cultivate in us a better understanding of our fellow men. This includes an understanding of how men use mathematics and come to see its power to solve problems and unlock other areas of knowledge. It includes also an attempt to understand why some men are devoted to mathematics with passion, as others are devoted to music, poetry, exploration, discovery or social welfare. This means that the mathematics in schools cannot be defined by some simple list of topics; as in all other expanding areas of knowledge the teaching must arise from knowledge of what is happening in the world outside, including the most recent developments.

It seems likely that the next few years will make heavy administrative demands on teachers of all subjects, in terms of reshaping the curriculum around new forms of examination, as well as shaping it to new patterns of schools. We must hope that the teachers' inevitable preoccupation with these matters will still allow adequate time to be given to assimilating the many recent innovations in school mathematics, so that they may be taught with

critical understanding. The wise incorporation of new developments in mathematics is a continuing problem, and we need to establish ways of doing this without the traumatic discontinuities of recent times. There is still much to be done if the growing wealth of mathematics is to be made more available to every child.

Planning the curriculum of a comprehensive school



MAURICE HOLT
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It is easy to recognize types of curriculum structure which can be identified as belonging to a grammar or a secondary modern tradition. There is no similar consensus about the character of the comprehensive school curriculum; reorganization may mean simply that the former bipartite structure takes on a new lease of life under one roof. There may be some experimental unstreaming in the first year or two, and perhaps a common-core curriculum for the first two or three years; but in the fourth and fifth years the latent banded structure is often made explicit by an option scheme enabling 'academic' pupils (whoever they may be) to drop expressive and creative subjects in favour of science or languages, while the others are free to concentrate on 'interest-based' courses, sometimes a link (and often the only one) with a college of further education.

Aims

There is no shortage of prescriptions for new approaches to planning comprehensive school curricula, but the important thing perhaps is to identify the point of view. Decisions about education involve values, and it is essential to know what value judgements are being made and on what ethical basis. If one takes as a starting point the proposition that a school's job is to educate, and turns to recent work by philosophers of education in order to see what the concept of an educated person implies in curriculum terms, the debate can be placed in perspective. We must recognize too that a school cannot be seen in isolation, but—as Malcolm Skilbeck has written—'engages in complex transactions or interactions with its environment which involve exchanges of ideas, resources and people through a network of communication systems'.[1] The head must recognize and evaluate the constraints

[1] SKILBECK, M. School-based curriculum development. London, 1973.

acting upon the school as a cultural sub-system, for these will affect decisions about the scope of planned innovation; but the curriculum plan itself must be firmly based on a concept of general education. There can be no other sensible basis for a school which accepts pupils of all abilities on transfer at 11-plus for five years of compulsory education. This, while we are about it, could be taken as a definition (with variations to allow for different systems of reorganization) of a second-generation comprehensive school; and a school can be more or less comprehensive as the components of a general education are more or less implemented as curriculum objectives for all its pupils.

To design and implement such a programme is a considerable task and one which can evidently only be based on the school itself; while the horizon must be surveyed to see whether other local or national curriculum projects, as they come into view, are likely to be helpful in any way, the school must stick to its own coherent programme and teachers themselves must act as change agents. To achieve this in an established school might call for a particular set of preconditions; but in a new school, starting from the ground up and 'growing its own pupils', it might well be possible within the normal pattern of constraints.

This, at any rate, was the view I came to during the two terms that elapsed between my appointment as head of Sheredes School in January 1969 and the school's opening with first year pupils only in the following September. Those first pupils have now completed their fifth year of a five-year unified broad curriculum with an unstreamed format, and although our tactics are under continuous review, as we learn more about achieving the outcomes we are looking for, our aims and the strategy for fulfilling them developed during our first year of operation, remain the same. What follows is a brief report on progress so far.

A clear idea of aims is essential, and particularly at a time when the effectiveness of the school as an institution is being questioned. Our aims are based on the concept of education developed by Peters and Hirst[2] and other philosophers. As Richard Whitfield (who contributed a helpful article on curriculum planning to TRENDS No. 30, April 1973) has stated, 'the weight of philosophical scholarship suggests that a general education is centrally concerned with the development of mind in certain distinctive and differentiated modes of human consciousness and experience'. Six or seven areas may be distinguished; Hirst lists formal logic and mathematics, the physical sciences, moral judgement and awareness, aesthetic experience, religious concepts, philosophical understanding, and awareness and understanding of our own and other people's minds. In some cases these can be directly related to existing subjects, but in others the areas must be covered, as in a jigsaw, by interrelations between existing subjects. We recognize

[2] HIRST, P. and R. S. PETERS. The logic of education. London, 1970 (Routledge and Kegan Paul).

also the need to meet aspects of the pupil's personal development by a limited option scheme sufficient merely to allow further vocational and academic courses as appropriate. All this amounts to a brief for the next stage; the design of the curriculum structure within which these aims can be implemented.

Resources

It is already clear that the structure must facilitate links between subjects. A problem may call for different sorts of inquiry; and it does not always seem most appropriate to present the differing disciplines to the pupil in their worked-out forms. But the way in which subjects are interrelated must take into account the logic of the aims as they have been developed. Pupils will need resources to enable them to work in a variety of ways. The resource facility is an implication of curriculum thinking—not the other way round. Although Sheredes was purpose-built as a five form entry all-ability school, it was not built with the kind of curriculum being developed there specifically in mind. No resource centre as such was built, but a system of local facilities centrally coordinated has proved quite satisfactory.

The timetable

If the needs of the entire ability range are to be adequately met in each faculty, the faculties will need to work out the best ways of doing it. With a faculty structure, the timetable can be blocked out so that a group of teachers, covering a range of appropriate subjects, is available. Team teaching is therefore another curriculum implication—but not necessarily one particular mode of team teaching, and certainly not for its own sake. The same goes for the arguments about independent and/or collaborative learning versus class teaching; they miss the point, which is to use the most effective means possible to achieve the desired outcomes. Sometimes these outcomes correspond closly to what can be called instructional objectives; parts of science, mathematics and most of languages, for example. But at others interpretive skills will be in mind, and the objectives will be expressive; the teacher may not always be certain of the outcome, for the interaction will involve the pupil's response. Even so, there is a clear need for staff to be aware of the kinds of criteria they need to apply in terms of the broad objectives they have in mind. In this sense—which need not be an uncompromisingly inhibiting one—the curriculum thinking must be rational.

To allow this kind of flexibility the timetabled unit must be longer than the customary 35 minutes. We have operated a day of four 70-minute periods since the beginning and in some faculties (creative activities, humanities) double periods of 140 minutes are preferred in the course of the week. And given that a team of teachers is working across the ability range in a block of time, it hardly makes sense to think in terms of formal setting by ability.

One wants the range of resources and strategies for learning to be available as flexibly as possible. There will be times when staff might decide to group together some bright pupils who will profit by it at that point or for that day or that week. But no formal timetable and staffing mechanisms are involved. In the same way, there will be times when a group of pupils of all abilities may be brought together; perhaps just a subject-group of 25, or a whole year of 150—to hear a speaker, see a film, watch a videotape. It is a question of what works best. And the decision lies with the teachers, as individuals and as members of a team.

Frequent informal contact between members of teams and of faculties is particularly necessary, with regular formal faculty meetings which cannot in general be timetabled. A better approach seems to be to recognize the amount of planning and preparation these approaches require and take this into account, as far as staffing permits, in determining teaching loads.

Curriculum structure:

Core	*Options*	*Year*					*Subject*	*Max. no. of GCE/CSE passes*
Hu	–	1	2	3	4	5	Eng., hist., geog., (+RE, moral ed.)	3 (model 3)
EA		1	2	3	4	5	Eng., music, drama	1 (music)
M		1	2	3	4	5	Maths	1
PA		1	2	3	4	5	P.E. games	
CA		1	2	3	4	5	Art, crafts, housecraft, design	1 (design)
S		1	2	3	4	5	Science	1
L		1	2	3	4		French	
	A			3			Latin, German, science, wood, metal, fabric, home econ., art appreciation	
	B				4	5	Science, tech d, French, art, woodwork, typing office pract.	1
	C				4	5	Science, Latin, commerce, metalwork, German, cookery, office pract.	1

KEY

One pass in integrated science (SCISP GCE or Mode 3 CSE).
Further options added to B and C as needed and available.

Hu—Humanities, EA—Expressive arts, M—Mathematics, PA—Physical activities, CA—Creative activities, S—Science, L—Languages.

The diagram shows how six of the seven faculties continue for all five years. Humanities interrelates English, geography and history and leads to GCE/CSE in these three subjects: mode 3 is essential here if the curriculum is to come first, and half the marks go on course assessment during years 4 and 5. But the humanities structure does more than this, for it embraces also work in moral, social and religious education as part of its five-year conspectus, and staff with specialist knowledge of these areas are added to the team as expansion permits. A whole year-group of 150 pupils is taught at a time with a team of basically six staff, recruited as specialists (there are heads of department in the examined subjects) who are keen to seize the opportunities interrelation offers. Expressive arts interrelates music and drama also with English,

since it is felt the scope of English activities might be limited by inclusion in humanities alone. This curriculum-area is free of 16-plus examinations, although obviously the English work is vitally linked to that in humanities, and music may be taken to examination level with some extra-curricular time. As the school grows, music will be added to the option B/C list (see below). Mathematics is based on the SMP course and leads to orthodox modern-maths mode 1 GCE/CSE. As with expressive arts, it is taught a half year-group at a time with three staff. It is convenient to retain five mixed-ability forms of entry for registration, in self-contained year accommodation with a year tutor, but to divide each year into six different mixed-ability groups for teaching. Each half-year can then be regarded as three subject-groups of 25 whenever this is a convenient division. Physical activities embrace PE (taught as a half-year with three staff) and recreational activities (taught as a year with seven or eight staff); team games are compulsory only in the first year when introductory courses are needed. Creative activities cover the range of art, craft and housecraft subjects and are taught a year at a time with seven or eight staff. After cyclic induction courses during the first two or three years, an integrated design course is begun which leads to a mode 3 GCE/CSE pass. Finally science follows the lines of Nuffield Combined Science for two years, moving to SCISP (Schools Council Integrated Science Project) for which Sheredes is a phase 2 trial school. All pupils follow this course (with a parallel mode 3 CSE course) so as to prepare for a single subject GCE/CSE integrated science pass; pupils may opt for additional science time in option B or C in years 4 and 5 and thus prepare for the double-subject pass.

All pupils take French for three years within the languages faculty. In the third year, option A allows introductory courses in German or Latin (Cambridge O-level course) to be begun, and is available across the whole year group: there is no hidden setting or streaming here. Then French and either German or Latin may be pursued to GCE/CSE in years 4 and 5 as options (B and C respectively). This scheme reflects the view that there is no educational justification, on our terms, for making a foreign language a compulsory requirement for five years for any pupils; but there is a sound case for making an initial experience of a foreign language accessible to all pupils, even if it is ultimately not pursued until the sixth form or even adult service courses at a much later stage. French, like science, is taught a half-year at a time with three staff.

Remedial education in English, mathematics and science is especially concentrated in the first year and operates as an integral concurrent component; all pupils stay with the mainstream, but slow learners are withdrawn (usually on an appointment system) as necessary. Thus, for example, a fourth remedial teacher might be added to the first-year science team in each half-year group for one of the two weekly periods. The whole remedial effort is coordinated across the curriculum by a teacher with this responsibility.

Moral education, while certainly a matter for the humanities curriculum, is also a question of practice and the need must be recognized for consistent values in relationships between staff and pupils. The school forum meets weekly so as to introduce pupils to democratic procedures, and the report-back to forms by their forum representatives also takes place in school time. The school counsellor has a small teaching load, is responsible for careers guidance coordination, and acts as third-year tutor. The year tutors meet weekly with the deputy head in the chair to exchange information on pupils, discuss general arrangements and consider, for example, whether to proceed further with a suggested case for referral of a pupil to the child guidance and psychiatric unit.

Regularly during the term the heads of faculties and year tutors and I meet to consider curriculum and associated matters and decide many issues: helpful suggestions may come from the curriculum consultative committee, which meets occasionally during the term and has a rotating membership of two representatives from each faculty.

The logic of this curriculum for the first five years is that it should continue into the sixth form, placing general education at the centre and seeing A-level and other examination work as peripheral but energized by the core of central studies. This plan has been agreed at a recent residential staff conference. Because of the methods of working and educational objectives pursued up to the fifth form, it should be possible to base a proportion of the examination sixth-form work on a tutorial approach.

The school is neither child-centred nor teacher-centred: it is curriculum-centred. And the curriculum is derived from a rationale of educational theory. This gives it its unity and ensures that pupils tune in to the same signals and values throughout the school. Using a faculty structure with teams of teachers, block timetabling, longer periods and an unstreamed format gives the scope and autonomy necessary to implement curriculum objectives across the ability range.

Motivation in further education: enlightened self-interest

SYDNEY BOLT

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Much teaching in further education has a parallel in school sixth forms. Other sections of further education overlap university areas. It is not in these regions, however, that the distinctive contribution of further education to curriculum and teaching development is to

be found, but in those more directly vocational classes which, for example, prepare apprentices on day-release for City and Guilds certificates, or school-leavers with the necessary O levels for Ordinary National Diplomas. These students have no need to commune with themselves to decide why they are studying. Without trying they can see the hard utilitarian point of it, and, for good or ill, it is this precisely defined utilitarian ethos which characterizes further education, the style and content of its teaching. The prime motive of the learner is not necessarily interest in the subject, but self-interest. He studies in order to get on in life, and knows exactly how successful study—indicated by examination results—will produce that reward. His aims, in fact, are definite and the teaching he receives is accordingly geared to the fulfilment of limited aims.

Treating students as adults

At the time when ROSLA's winged chariot was hurrying near, advocates of pupil-centred learning in schools pointed to the cooperative atmosphere of technical colleges and the lack of resentment among their students. This admirable state of affairs, they rightly stated, was the result of treating students as adults. What they failed to understand, however, was that treating a student as an adult does not, in educational terms, imply an interdisciplinary curriculum or student-centred learning. It implies their opposites, because it means treating the student as if he had stopped growing.

That the student has stopped developing is, of course, totally untrue, but it is a useful fiction because it leads to an educational approach which he finds acceptable. While continuing to provide the practical guidance and counselling which he may require, the institution relinquishes responsibility for his all-round development, as being from now on the student's own affair. The business of further education, as seen by most lecturers and students alike, is specialist teaching. The student is not there to learn what every human being should know, but rather to acquire particular skills which are only required in particular jobs, not by all citizens, but only by those citizens who happen to be engaged in them.

It is true that further education is also supposed to provide for non-vocational needs in the form of liberal or general studies. Ministry of Education Circular 323 (1957), for examples, gives further education colleges some responsibility for the spiritual, moral and aesthetic development of their students. The history of the implementation of this policy, however, only goes to show how hostile to the general ethos of further education this aim is, in fact. It would be wrong to assert that it has been a total failure. There have been notable successes, but only in individual cases, as the result of special conditions, and those successes have been achieved against great odds. The prevailing tendency in general studies is now to integrate them into the vocational curriculum.

As adults, students want to see the point of what they are doing, and by and large they do not believe that teachers are equipped to teach them how to live. The only point in attending an educational institution is to learn something *you* don't know, which the teachers there *do* know. The teacher of plumbing, for example, has the technical qualifications which the apprentice plumber lacks. He knows how to pass the tests and examinations which the apprentice wishes to pass. In this one area, if in no other, he is acceptable as an authority.

For this reason, the educational process is not student-centred. The teacher knows what to tell his students and does so. He does not place instructive food in his students' way, and leave them to eat it or digest it naturally for themselves. If necessary he will even force-feed them, and far from resenting this the students find it right and proper. They expect the teacher to be somebody who knows what he is doing, and what the teacher does is something done to them, the students. In consequence, teaching in further education, if not authoritarian, is at least authoritative. Learning is organized not as a natural process, but as an artificial one.

In one sense, at least, this process is far more adult than pupil-centred learning: it requires the student to do more than respond spontaneously to the situation in which the institution places him. It requires him to make a deliberate effort, to concentrate on what is strictly relevant, however interesting the irrelevant may be, to pay attention irrespective of the immediate pressure of the here-and-now. After all, the way in which a rat, spontaneously pursuing a piece of cheese, learns its way round a maze without intending to, is by a pupil-centred process. You cannot say to a rat: 'Look here, we are both grown up. You're here to learn your way from A to B. Let's cut out all this irrelevant business with the cheese, shall we?' But you can make an approach along those admirable lines to a student—provided, of course, that he wishes to learn his way from A to B, and that is what students in further education know they are there for.

Strengths and weaknesses

So much for the characteristic educational approach to further education. It has great strength, and is capable of wider application. In schools it cannot, perhaps, be applied to pupils who are constrained to attend, whether or not they see the point in doing so. It is based entirely on the student's sense that he is learning something useful. Teachers in schools who are concerned with the education of the 16–19 age group might, however, profitably consider this narrowly utilitarian approach, especially with regard to those pupils who are not bound for higher education. The snag, of course, is that it involves closing options. The student who embarks on a course which will gain him useful office skills sets out on a path which leads away from other goals which might also be open to him.

It must be admitted that from the point of view of further education itself, even considered narrowly as the preparation of students for roles in a modern industrial society, the ethos so far described has its weaknesses as well as its strengths. The teacher is considered as a man who knows the answers. Now, it is true that all skills, processes and machines can be considered as answers to practical questions, but, like other questions, practical questions admit of more than one answer. A reciprocating engine is not the only answer to the problem of how to convert combustion into motive power. New answers are, in modern conditions, continuously being found, and the student must therefore be prepared to approach his subject, however technical, in a hypothetical frame of mind. He can no longer go to a technical college to acquire a set of habitual skills which will suffice him through his working life. He has to be equipped for a life-time of education, must learn, in short, to become a student of engineering, not just an engineer.

The danger is that, in the prevalent atmosphere of further education, he will learn his useful lessons passively, so that the skill he acquires appears not as *an* answer to a question but as *the* answer, and it cannot be denied that vocational teaching sometimes takes the form of elementary dictation. Recent developments in the field are therefore aimed at remedying this deficiency.

The educational functions of FE

There is, to begin with, the overt policy of reserving an educational function, as distinct from a training function, for further education, with a consequent widening of vocational syllabuses, as is manifest in the provisions of the OND in technology. The increasing tendency for the syllabus to be made a college responsibility, organized by the teachers directly concerned with it instead of by an external body, operates in the same direction. Particularly significant, in this respect, is the inclusion of general studies as an integral part of these new arrangements, because the resulting wider view of a vocational subject develops a more flexible approach.

The main effort, however, has to be directed to the attitude to education of the teachers and the students themslves. Too many lecturers in further education have professional qualifications but no pedagogic qualification, and although colleges of education are every year increasing the number of new entrants to the profession who are educationally equipped, the numbers involved amount to only a small fraction of those actually engaged in teaching. To remedy this, there has lately been a considerable development of in-service training.

As regards the students, not all but far too many enter further education as a second best, as a result of relative failure at school. Various handicaps have prevented them from grasping the difference between possessing information about a subject and understanding it, so that their capacity for intellectual interest is fitful at best.

Indeed, they often lack the linguistic means essential to sustain such an interest.

It is here that, over and above the part they can play in helping to devise new syllabuses, teachers of general studies can find their opportunity to play a specific, definable role. Too often, as for example in the City and Guilds pamphlet on the subject, the role of general studies, with regard to the English language, has been defined in terms of 'communication'. To teach vocational students how to use language to structure perception, to frame and consider hypotheses, to exclude irrelevance, question coherently, and come to terms with matters unfamiliar or even unsympathetic, is to render them a far more useful service—and, precisely because it is useful, a service which they see the point of just as they see the point of acquiring more immediately profitable skills. Which returns us to our starting point. None of these more liberal developments in further education will have the effect of shifting its utilitarian foundation. If education must replace training, it is not because it is a higher thing but, quite simply, because it is a more effective preparation for the world of work, in which the students know they have to earn their living. Nor is this anything to be deplored. Interest is what matters, after all, and academic interest is not the only kind available.

The rationale and strategy of curriculum planning

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R. C. Whitfield's article on this subject (TRENDS IN EDUCATION No. 30, April 1973) summarizes some of the arguments advanced in his book, *Disciplines of the curriculum* (McGraw-Hill, 1971). This work is important because in it he attempts to derive from recent theoretical work in educational philosophy and psychology, and from the descriptions and analyses of their work by practising teachers, a curriculum for the older child which is both consistent and feasible. In my view, however, there are certain weaknesses in his arguments which render his conclusions unsound.

I believe, however, as he does, that the curricula of schools should be derived from theoretical considerations rather than *ad hoc* necessity, and that Whitfield's article provides a convenient starting point for the discussion of alternative views of the nature of curriculum planning.

Summary of Whitfield's arguments

Whitfield argues that an effective curriculum must have objectives and that these objectives are usually derived from either the needs of the child, the needs of society or the body of public knowledge and experience. The fact that these apparently equal sources of curriculum objectives have to be satisfied leads to an uneasy compromise which is bound to fail. Whitfield's major point is that of these three sources the last should logically come before the first two, so that if one gears a curriculum to suit public knowledge and experience one will also meet the needs of society and the child. One quotation from his book will show that Whitfield is not being misrepresented: 'We should therefore ground our curriculum objectives in the distinctive disciplines of knowledge, rather than in social needs, theories of personality, or in a notional base knowledge for "living in the modern world". For it is the disciplines themselves which predetermine these important factors'.

Given, then, that the curriculum must correspond in some way to the disciplines of knowledge, what are these disciplines? The ideas of P. H. Hirst and P. Phenix are discussed and Whitfield plumps for the latter as being more flexible and human.Thus it is the six 'realms of meaning' rather than the seven 'forms of knowledge' which provide the basis for the calculation by which we are led from theory to practicality. The calculation is performed in chapter 17 of his book. The inputs are: 1. Phenix's assertion that the school curriculum should devote approximately equal time to each of the seven realms of meaning, 2. Whitfield's modification of this so that the area of symbolics has double weighting, 3. the estimates of 15 practising teachers and Whitfield himself as to how much their own discipline contributes to each realm of meaning, 4. the present-day curriculum of a typical grammar school and a typical secondary modern school in subject terms. The output is a table of the curriculum of boys and girls in grammar and secondary modern streams, not in terms of subjects but in terms of the realms. The deficiencies of this curriculum are pointed out and the table in TRENDS (page 41) is the outcome of this logical piece of curriculum planning.

Another view of curriculum planning

Whitfield's views, as summarized, fall neatly into the mould of Hirst in his article *Rational curriculum planning* (Schools Council Working Paper No. 12, 1967). From objectives we move logically to content and from content logically to method. An alternative view, more complex, more dynamic and, in my view, more realistic, allows for an element of feedback from the learning experience in the classroom to the objectives of education and for a consciously held evaluation of objectives, content and method. Such a view is by no means original. J. F. Kerr (*Changing the curriculum*, University of London Press, 1967) exemplifies the notion in a tetrahedral model which has at its vertices curriculum objectives, know-

ledge, school learning experiences and evaluation. The six sides of the tetrahedron are two-way arrows demonstrating the mutual interdependence of each of the four vertices. Implicit in such a model are notions of flexibility and response to feedback in a curriculum which does not depend on objectives drawn solely from the disciplines of knowledge, but also upon the child and the society in which the curriculum obtains.

To maintain a position such as Whitfield's demands the adoption of a certain epistemological stance which may be termed 'absolutist' and which is by no means unquestionable. Sociologists since Manheim have been engaged in formulating and making more explicit the claim that what we call knowledge is by no means certain and that it is in fact determined by culture and by society. To take a trivial example, the American parent knows that his child is being educated while the Russian child is being indoctrinated; the Russian parent knows that the reverse is true. If it is then argued that what we are here talking about is interpretation, and that six sixes are 36 in Moscow and Michigan, the sociologist of knowledge might reply that even here the western assumption of the priority of rationality is the value that is concealed in the statement.

The English school history book contains a different account of the Armada from the Spanish account. The Japanese and American high school texts differ in their account of Pearl Harbour. The culture has produced a different account of history which must presumably count as historical knowledge for that culture. The ethics course at a Marxist university and a western university may both present accounts of Plato's ethical theory, but the critiques will differ and yet both critiques may justifiably be called philosophical knowledge. Even in the sciences—both natural and social—differences may be discerned on either side of the Marxist/non-Marxist line, as may be exemplified by the different treatments of genetic theory and behavioural psychology.

The claim is that the statement of fact (knowledge) conceals a value, and the value conceals an ideology which is dependent upon a complex of culture and society. To speak of the disciplines of knowledge being prior to the needs of society is to make the naive assumption that there is but one society or that ultimately all societies have the same needs. If it is argued that, in the long run, it will be shown that one set of knowledge is right and all the other sets wrong; it can be counterclaimed that only in the cases of mathematics and the natural sciences could such knowledge—subject in any case to a non-proven and dubious verification principle—be claimed to have absolute rightness and uniqueness. In all other cases interpretation is a part of the discipline and inextricably bound up with the culture and its society.

The point that is being made is that it is misleading to suggest that the disciplines of knowledge can somehow stand apart from society and that, properly understood, can illuminate the needs of society and cater for the needs of individuals within that society.

The individual, his society and the 'knowledge'—however differentiated—of that society are intimately bound up, and the 'uneasy compromise' referred to by Whitfield is a necessity unless one adopts an idealist ethical position and an absolutist stance with regard to the nature of knowledge. Both positions are, to say the least, not wholly certain.

Neither Phenix nor Hirst refutes the point made above about the relevance of the sociology of knowledge. Even allowing for the hard cases of symbolics and empirics (Phenix) equated with mathematics, logic and the physical sciences (Hirst) which may prove ultimately to possess 'hard' knowledge (demonstrable, in principle, to have ultimate truth value), the remaining disciplines—literature, history, morals, religion, philosophy (Hirst)—most certainly lend themselves to analysis in a sociological way. For Phenix his equivalents are the more complex, even superior, disciplines. To accord them logical priority as a source of curriculum objectives is, in my view, mistaken. It is our view of the individual and society which predetermines our view of the nature, contents and importance of these disciplines, and it is this view, which is held by such writers as Charity James (*Young lives at stake*, Collins, 1968) that represent a commonsense interpretation of a complex sociological-philosophical position. One may agree with Whitfield and others that she expresses her views somewhat tenuously, but this does not invalidate their source—a non-absolutist view of knowledge.

A strategy for reform

There are I think—though this is not the place for a detailed discussion or demonstration—sufficient hints within the editorial chapters of his book to show that Whitfield adopts an ethical position within the Idealist/Christian area. It is often the case that those who hold to these sorts of position also adopt an absolutist view of the nature of knowledge—the two being linked both by predisposition and an appropriate metaphysic. Just as I have argued that there are weaknesses in the epistemology, so I would argue that a Utilitarian view of ethics—looking to the consequences of one's actions rather than to one's motives or the actions themselves—is at least as tenable. Thus there is at least as good a case for structuring the curriculum according to the needs of society and the individual as in structuring it in accordance with Whitfield's criteria. The true test might be that the 'uneasy compromise' referred to earlier be made more natural.

In practice people of widely differing ethical viewpoints agree to a very large extent on practical decisions, especially when talking about the educational situation. I share Whitfield's concern for the individual and for society as far as morality is concerned, and I would agree with him that all does not seem to be going well in the field of moral education. But the point I would make is that it is precisely in the interrelatedness of many of the different forms

of knowledge or realms of meaning, when they are seen in the context of society, that the full extent of their ethical implications may be worked out, made plain and seen—for themselves—by the pupils. Science, history, politics, ethics and religion should not be left separate on questionable grounds when such an event as Hiroshima unquestionably brings them together, and pupils—even 'dim' ones—know that the question, 'What would you have done if you'd been in charge?' is not a silly question designed merely to fill up time.

Quite apart from the necessity to see many things from a global viewpoint in order to see their connexion and to appreciate their significance, it is quite obvious that both the individual and society have their needs. Individuals need not just human understanding but the opportunity to choose an interesting and satisfying role in life and to be capable of profiting from appropriate training. At different levels this requires different mixtures of knowledge from the various areas and it is obvious that for different groups of people at various stages in their lives specialization of one form or another is not merely justified but necessary. What we need to argue about is *how* much specialization and *when*, and, once we have accepted the need for an initial curricular balance in education, these are questions that must be answered empirically with reference to the demands of society.

My own strategy for curriculum reform is by no means as precise as Whitfield's, but I suspect that he would not disagree too much. The key educational problem is in the field of symbolics. There is confusion in the first school about the teaching of the three Rs, and the gains in pupil understanding and teacher methodology do not seem to reflect the amount of money spent on basic research and new apparatus. This is not an educational problem alone, but it should be tackled urgently and there should be a period when an all-out onslaught is made on this problem. If necessary time should be made in the first school curriculum by weeding out all that is of 'dubious' value, or which could be done—with equal profit—at a later age. During this stage the curriculum of the middle and secondary school should remain more or less constant, with nothing that 'works'—be it an interdisciplinary project for recalcitrant ROSLA children or cramming for an Oxbridge scholarship—being thrown out. During this phase a great deal of thought should go on about the content and style of the education of 9–16 year olds, and a government policy should be laid down.

I have deliberately used the words 'dubious' and 'works'. Most things are doubted by someone; exceedingly odd things can be made to work by some teachers. But I am making an appeal, to use old-fashioned terminology, to 'men of good sense'. I am pleading for the forces of conservatism to assert themselves against ill-founded 'liberal' ideas, and I am suggesting that, in the present anarchical state of curriculum practice, the time is ripe for a much stronger central control of both content and method than we have

been accustomed to. In the first phase this could be achieved by a unified policy, implemented through the inspectorate, teachers' centres and the colleges and departments of education, with regard to the teaching of reading. I am aware of the questions that are being begged, but if a normal child of eight cannot read well enough to regard it as a convenient tool for learning and means of pleasure, then the parents of that child and the teachers of the middle school have just cause for complaint. I am assuming that controlled experiences in writing go hand in hand with the learning of reading and that a satisfactory standard is achieved here too. Some guidelines could also be laid down centrally as to an appropriate standard of computational skill. When infant school ended at seven, it was perhaps legitimate that the first year of junior school should be spent in basic skills for some children. With the advent of middle schools, the first schools are given adequate time for the task, and there is every right to expect competence.

While the problem of the basic skills is being tackled the curriculum of the middle and secondary schools should remain static, and attention should be paid to the rationale of their curriculum. Absolutist views, such as Whitfield's, and relativist views, such as mine, should be seen as complementary to one another, and would probably serve as useful safeguards against any form of extremism. The context of the curriculum design should, however, be the dynamic model rather than the linear model. Apart from the reasons already discussed, the more pragmatic approach is probably more suited to the British way of thought and takes more cognizance of the *status quo*.

I recognize that many of my arguments may be subject to the same sort of criticism that I have levelled at Whitfield, but in this we are agreed; something is wrong and this is no time for complacency.

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School timetabling by computer

Timetabling in large schools is a problem, especially now when there is a growing demand for a wider variety of courses. Can the computer help?

T I. DAVIES

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If you staff all the classes of a school in a certain very definite way, by insisting that teacher 17 should take French with Form 3a, that teacher 23 should teach geography to 2c, and so on, one effect it has is to limit severely the choice of curriculum structures that are open to the school to adopt. Conversely, if you put up a curriculum structure in meticulous detail, by insisting on highly particular batteries of options and sets, the effect of this is to limit with equal severity the number of ways in which the classes of the schools can be staffed. Now if you insist on a certain pattern of staffing *and* a particular curriculum structure, the chances are that the two sets of specifications will prove to be hopelessly incompatible. This in a nutshell is the cause of the difficulty that faces the school timetabler; and a very great difficulty it is, especially in the large schools of today.

We come to this task, of course, from a background in this country of small schools that used to be dominated by teacher personalities. It was to be expected that the headmaster should have firm ideas as to who exactly should teach perhaps the majority of the classes. The result of his doing so in terms of curriculum structure was hardly very significant, because in those days of fine streaming, without any elaborate setting, each form could be treated more or less separately, except for any options that were organized across parallel forms. Those were the days when the timetabler enjoyed reasonable freedom of movement.

The large school

Things are different today. Central to this difference is the fact that a school has always more teacher-periods—more spaces to be filled in the timetable—than there are pupils on the books of the school. A school of 1600 pupils has something like 2600 spaces to be filled in its timetable: an index of the magnitude of the task that now faces the manual timetabler. And as for he headmaster, he has in theory to determine the staffing of at least 600 classes—a job which in practice, of course, he would not dream of attempting. Yet the likelihood is that as a carry-over from the days of small schools, his attempt will go further than is consistent with

the comfort, if not with the sanity, of his timetabler. This is an area in which it is all too easy for specification, in terms of staff, to become over-specification, especially if the headmaster also has strong views about curriculum structure. Forms and streams have over the last 10 years been broken down, and replaced by strings of options and sets that span a large part of the school's individual year groups; which means that time and again the teachers are tied together in batteries, for synchronized teaching. This in itself would not worry the timetabler unduly, if only the batteries were consistent in their composition. But they are not. In Forms 1–3 the teachers may be tied together in accordance with single-subject sets, or with areas of common interest that correspond to the human faculties and therefore make philosophical sense. But in Forms 4–6 they are strung together in options that relate to the career intentions of the pupils and hence make philosophical nonsense. The potential conflict between the two factors, of staffing and curriculum structure, is immeasurably greater today than it was, say, 20 years ago.

This conflict is so all-absorbing that not enough energy or time is left for attending to another factor, which from the standpoint of the pupil is certainly more immediate, and in the long run probably more important, than either the staffing of classes or the structure of the curriculum; and that is the nature of his school day, or the quality of the experience that he derives from it. Compulsory attendance in the secondary school amounts to an aggregate of some 1500 days; and the outcome depends very largely on the satisfaction, or lack of it, that a pupil gets from living through that period; and on whether or not there is rhythm in his work, an alternation between sedentary and active pursuits, to keep him fresh and alert until 4 o'clock. Conflicts between staffing and structure are usually resolved at the expense of timetable quality.

The time factor

In the midst of all the changes that have recently overcome the secondary school, there is one factor that has stayed the same. Teachers may still resign their posts up to 31 May; which leaves the same seven weeks as before, in which the timetabler must get the job done so as to be ready for start of school in September. It is arguable that to put two timetablers on the job is an advantage, provided they are very carefully picked; though to recruit more than two is to court disaster. My impression, for what it is worth, is that the magnitude of the timetabling task has by now substantially outgrown the available resources of 2 men × 7 weeks; that we are learning to live with features—bad features—of the school timetable that we should not have tolerated even 10 years ago. The piling of a form's French into one end of the week, Form 6 clashes, double-period lessons where there should be singles, unduly short bursts of practical work, two or more teachers

sharing the same mathematics or English class, a sorry lack of rhythm in the school week of a great many pupils—these add up to the price that schools pay for a rate of skeletal and organizational growth that has far outstripped the growth of the school's central nervous system. The same thing happened long ago to the dinosaurs. And after what has been written it is hardly necessary to say that nobody is to blame for the recent deterioration in the quality of school timetabling. It is fashionable, but wrong, to justify computerization of the school timetable on grounds of economy in the use of staff time. The fact is that, given the absolute limit of 2 men $\times$ 7 weeks, the manual production of *good* school timetables is no longer in the realm of the possible, at least for large comprehensive schools. Computerization of the timetable is an unavoidable condition of the future success of these schools.

Introducing the computer

The computer must have a scheme of logic as a model to follow; the obvious choice of model, of course, is the headmaster who has been doing the job through the years. But then there are two kinds of headmaster; the one of a stable school, of which he has been in charge for say five years or more, and the other who is now caught in the throes of reorganization, and who this year for the first time is without a Form 1, but has 600 more pupils and a second set of premises two miles away. It is senseless to think that these two will employ the same timetabling technique; so the question arises of which headmaster is the computer to adopt as a model.

We have seen that time-tabling has proximately to do with two sets of specifications (the one of staffing, the other of curriculum structure), whilst ultimately it has to do with such compromises as will resolve the conflicts between the two sets. Now the big difference between the two headmasters is that one of them has had five years in which to arrive at his compromises. As a result, the plan of the school that he presents to himself for next year is based on the tried and proven; and therefore is almost certainly workable. With a few manageable exceptions that arise mainly from recent staff changes, his two sets of specifications are compatible in detail. This does not guarantee that his finished timetable will be a good one, or that the agony of finding locations for the last few lessons will be any less severe this year than last; but at least he was able to provide an initial plan—one plan—for the school, and afterwards more or less to stick to it.

The second headmaster, lacking as he does the benefit of five years' working experience, must somehow devise a quick workability test that will act as a substitute for this experience. The one approach begins with a plan that is close to the tried and proven, and therefore workable, whereas the other one generates as its proximate product a selection of plans. So in asking which of the

two approaches the computer unit should follow, we are in effect posing another, much wider, question. It is this: what kind of service do we expect the computer eventually to provide? A scheduling service simply, that is based on one set of firm specifications supplied by the headmaster, and which begins on 1 June? Or else a service that starts further back, by generating alternative sets of workable specifications for the headmaster to look at, and choose from, quite early in the calendar year; and which then carries on to the scheduling stage in high summer? Such a service would need to be based on a workability test similar to that already being used by those headmasters who are caught in the throes of reorganization, and about which something will be said later.

The computer's problems

It was entirely natural that when computerization of the school timetable started in this country the model adopted should be that of the headmaster of the stable school, whose specifications had already been perfected by working experience. The ideal from the standpoint of the computer unit was, and so far remains, for the headmaster to take his present year's timetable (or even next year's already done by hand), and to extract from it a set of specifications that of course are known to be workable; and then to feed these specifications into the machine with the hope of producing a better quality timetable than was possible by hand. A laudable if limited exercise that tends, however, to be marred by two working snags. First, the starting point of it is so far forward that the headmaster is required to state his specifications on unfamiliar data sheets, the syntax of which is so foreign to him that at times he must want to revert to the old method. Secondly, there are always some changes from last year that he wishes to make, and others that he must make because the school staff has changed; but to specify these changes in detail is almost certainly to run into over-specification, and the creation of conflicts that can only be resolved by reference back to the headmaster. Hence what began in good faith as an exercise in computerized timetabling is quickly eroded into computer-*assisted* timetabling; a term with a ring about it of deference to the headmaster as 'the man who knows what he wants'. What he does know, or will learn very quickly, is that any reforming zeal on his part, that leads him to make sweeping changes from last year, can only produce such lengthy 'conversation' between him and the computer, as to incur the risk of there being no timetable ready for September. To indulge one's zeal is to exceed the machine's terms of reference as these are at present formulated. However, within these provisional terms the computer experts have met with outstanding success. Their choice of model caused them to plunge at the very beginning into far the most difficult part of the whole timetabling process; and the full worth of their labour to date will only be realized

after the whole aim and object of their participation has been changed and re-stated—as I am convinced it soon will be re-stated.

Another thing that headmasters know only too well is that school timetabling as yet is by no means a full-blown technology; nor can it become so until somebody has worked out the equation that connects the three factors of staffing of classes, structure of curriculum, and quality of timetable.

They also know from experience how easy it is, without this equation, to overplay one of the three factors and so spoil the school by making a hash of the other two; and that by the time this hash is discovered the seven weeks are up, and little or nothing can be done about it. In sum, what they know—more intuitively, perhaps, than by experience—is that for any given school timetable the three factors exist in a particular balance—good, bad or indifferent. And rather than be deferred to as 'the men who know what they want', they would dearly like to have demonstrated to them a selection of different balances that could be applied to their own schools individually.

Towards a solution

This brings us on to the second model, of the headmaster whom reorganization has forced to devise a quick workability test, as a substitute for working experience. His method began as a form of doodling, which has acquired an anatomy which is roughly this. The school week is divided into so many equal time blocks into which the curriculum's classes and teachers—whole classes, not single lessons—are fitted in this way and that, so as to produce a variety and choice of curriculum structures, whilst ensuring that in each time block the school's teachers are all accounted for, whether in class or in the staff-room, and that from block to block all the curriculum's classes also are accounted for. That is why the method is called the 'blocking technique'. Afterwards the time blocks are broken up and randomized, so that each class gets a suitable spread of lessons in the week. This, of course, is very much an over-simplification, because a curriculum's classes take up different numbers of periods and therefore do not fit neatly into standard time blocks; left-over lessons are displaced into other blocks where vacant locations must be found for them. This hunt for locations is so inseparable from the timetabling task that the most we can hope for is to reduce the range of the hunt to manageable proportions. This is achieved as well through 'blocking' as it is through piecemeal year-to-year modification, but with the great advantage that it brings with it a new freedom to explore curricular possibilities, a new element of choice from among many workable schemes.

So far there are two separate movements afoot in this country, based on two different models, one of them promoted by computer people but the other not. The former is running into a difficulty that is inherent in the limitation of its chosen model. The message

of this paper is that the way out of this difficulty is pointed by the second movement that is associated with the 'blocking' technique. I look forward to the day, very soon, when the two techniques will be fused. Then the headmaster will need to be exhaustive only in his preparation of the school's budget of classes. When it comes to staffing these classes, and building them into a curriculum structure, he will be specific only in those areas where he is already committed, or where his mind is absolutely firm. Thus he will avoid the troubles that arise from over-specification. His other instructions will be in general terms, such as that in the staffing of classes the computer programme should operate an educational principle like specialist teaching, or general form teaching, or widespread setting, or team teaching; and these instructions will not be on complicated data sheets, but supplied in terms of a suitable but simple curriculum notation. Most important, the operation will begin about January, or as soon as next year's composition of the school is known, so that the headmaster may have plenty of time to discuss with his staff a good range of workable schemes, in which the component factors are held in a variety of balances, from among which to choose the one that by common consent seems best for the school. Then, by June, the scheduling will be done by the use of techniques already worked out. If all this sounds idealistic, then my reply is that already we are much more than half-way there.

Correction

Malcolm Parlett, the author of 'The new evaluation' (TRENDS 34) was formerly lecturer in the Centre for Research in the Educational Sciences, University of Edinburgh. At the time of writing his article, he was involved in an educational research project at the Massachusetts Institute of Technology, and not as we stated.

Some effects of involving parents in the curriculum

In the past, parents have rarely become involved in the curriculum of the school. What happens when we deliberately take steps to include them?

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In recent years there has been a growing interest in the role of parents in the educational process. It has been argued that any improvement in parental attitudes could well have a marked effect on school achievement. One way of influencing these all-important attitudes is to encourage a greater degree of cooperation between home and school. Such reasoning has been implicit in recent action-research programmes.

Figure 1 suggests a schematic model for the growth of such educational cooperation within a school. It will be observed that the various activities (of which only examples are given) appear initially to cluster at three distinct levels, which I have called the observational, the instructional and the practical levels of educational cooperation. These levels are hierarchical in that the respective positions reached by the schools on the model provide an indication of the relative strengths of such cooperation within the communities. Thus a school starting from scratch would tend to introduce and consolidate some activities at Level I before attempting the more demanding ones of Level II, and so on. In its progress through the tree-like structure, some activities may be completely by-passed and others developed in their places in response to internal or external pressure, the school community finally settling at a level determined primarily by the headteacher and staff but reinforced by the parents. It should be noted here that the model refers only to direct educational activities which focus on the school. Such things as fund-raising events (which are indirectly educational) and home visits (which take the teachers out of school) are therefore excluded.

Previous research projects have concentrated on the introduction of activities at the lower levels of this spectrum, and for some years I wondered whether a fourth level—characterized by direct parental involvement in the curriculum—could exist as a dynamic entity in a school. I have called this the formal level of educational cooperation because its existence would imply that parents were involved in parts of the formal school curriculum on a regular and

pre-structured basis. Many teachers already involve parents from time to time, perhaps by sending their classes home with some specific request for information or parental help. But there is little doubt that such requests are spasmodic and also unstructured in terms of the planned class curriculum. My interest lay more in writing the parents in from the very beginning, so that parental contributions would be seen by teachers, children and parents alike to be complementary to the functioning of the class as a learning unit.

Action research

Between the autumn of 1969 and the summer of 1973 and with the gratifying cooperation of several junior school communities in the south of England, I initiated a number of action-research programmes to test some of these ideas. During this period various pilot studies were undertaken, but the main phase of the research involved classes chosen from two schools, A and B, both with well-established traditions of parental involvement at Levels I, II, and III of the model of figure 1. Apart from this necessary common denominator, the schools exhibited a number of differences in situation, organization and catchment population. Initially five teachers and about 180 children and their parents were involved over a concentrated six-month period, after which the School A cohort continued for a further six months, making a year in all.

The involvement of the parents evolved from the concept of the *home assignment* as being a task set by the teacher each Friday which, ideally, would satisfy three criteria:

1. that it grew from and contributed to the school curriculum;
2. that it involved the parent and child working together in some meaningful activity; and
3. that subsequently it would be possible to detect the extent of parental help.

The first of these would be particularly important if the assignment was to be seen as having relevance and real value in the context of the class curriculum. The second implies that the parent feels competent as well as willing to help, but, since there will always be extensive differences in academic terms between the members of any typical parent group, it was clear that this help would have to focus on other more equable adult strengths than personal education. We therefore decided to look towards the abstract features of versatility, initiative, common sense, sense of responsibility and organizational acumen, qualities which we felt would be applicable to adults in general whatever the level at which their own formal education had terminated. The third criterion was incorporated strictly as a research requirement. It should be clearly understood that we resolved at the outset that there should be little resemblance between the pattern we envisaged and that of the more traditional concept of 'homework'. The

younger age of the children apart, our objectives were radically different. What we had in mind was to tie the family unit constructively into the education process, with the home and the school pulling together in the same direction.

To devise a regular weekly assignment which takes cognizance of the three considerations I have listed is no mean task, and it is a tribute to the skill of the teachers involved that four out of the five did so with increasing success. As an illustration of the kinds of things set by the teachers the titles of the 16 weekly assignments given to the second year juniors of School A are listed in figure 2. Although it is not possible in this short article to amplify these and place them in the context of the current curriculum, we can see immediately the emphasis on looking, finding and collecting, all being activities which would not place one family at a significant advantage over another. We find an enthusiasm for investigational assignments in which things have to be unearthed and various recordings made as a result.

In all of these assignments it is clear that the parent has a useful and sometimes indispensable role to play, but the additional strength of most of these tasks lies in the fact that the child too has a unique contribution to make. He contributes a superior knowledge of what has to be done from the discussions that have taken place at school, and specialized class-orientated information referring to current pedagogy, methods of presentation and—dare I say it?—the teacher's own idiosyncracies. If the parent-child team is to make a thoroughly acceptable job of an assignment this is vital information that it can scarcely do without. I suggest that it is essential to build in this interdependence when initiating activities of this kind. This particular teacher's routine for setting the work was to discuss the assignment in some detail during the Friday afternoon and then to write a brief summary on the board for the pupils to copy on to duplicated forms. These were then conveyed home to their parents. During the early weeks, like some second-class postal services, the system frequently proved unreliable, a fact which will come as no surprise to teachers! But the thing that made *this* form different from any other letter making the precarious journey from school to home was that the parents were expecting to receive it at the same time each week, and this predictable routine soon secured a degree of reliability from the carriers which was truly remarkable.

Perhaps it is appropriate at this juncture to point out that the assignment programmes at both schools were backed up by an extensive home-school communications web which included:

1. periodic evening meetings for teachers and parents to allow for two-way discussion of the project and to resolve any misunderstandings;

2. fortnightly newsletters from school to home containing project news plus suggestions for visits to current local exhibitions and places of educational interest; and

3. personal letters to the parents of a number of children having specific curriculum weaknesses (for example in reading comprehension or mathematics) suggesting ways in which the parents could help the school tackle their child's particular problem.

As well as providing opportunities for the exchange of information these various media also helped to generate and sustain the essential *esprit de corps* needed to carry each community through its very demanding programme of curriculum involvement.

Evaluation

The evaluation of the programmes took two forms. Firstly, by administering various standardized tests of verbal and non-verbal reasoning, mathematics and reading attainment to the children immediately before and after the main six-month period, various inferences were made about the effects of the programmes. Simultaneously the parents were given questionnaires, the development of which I have described elsewhere,[1] which were designed to provide several measures of parental attitude. Secondary evaluation was carried out following a series of semi-structured personal interviews with all five teachers and a sample of 50 sets of parents. Some repeat measures of intelligence, attainment and attitude were taken six months later by which time the community of School A had developed independently some further programmes of co-operative activities. Of these two strands of evaluation I shall concentrate only on the one relating to the test and questionnaire programmes.

Essential complementary information needed for the analyses concerned the degree of parental involvement in the assignments, and each week the teachers had the unenviable task of monitoring parental response on a numerical scale from 3 ('parent definitely helped child') to zero ('definitely no help from parent'). At the end of this time the parental scores so obtained were taken with other measures of interest (such as attendance at evening meetings) to produce an individual score representing the degree of parental involvement in the project and its attendant activities. This Parental Involvement Factor (PIF) was then used as a basis for the formation of pupil control groups from within the classes following the project at each school.

Space will not permit a full discussion or even a complete listing of the findings which the reader will find in the original study,[2] and I give here merely the briefest summary of some of the main points to emerge. All conclusions with respect to standardized tests are statistically significant at the 5 per cent level or beyond.

1. There was a general rise in the school performance levels of all the children involved which exceeded the improvement to be expected from their increase in age alone.

[1] Wood, A. J. Parents and the curriculum—a study of academic cooperation and its effect on children, parents and teachers. Unpublished PhD thesis, University of Southampton, 1974, pp 406 - 53.

[2] Op cit, pp 258 - 311 and pp 373 - 84.

2. In reading comprehension at School A, and verbal reasoning and mathematics at School B, children of highly involved (high PIF) parents showed considerable improvement over children in general whilst the respective control groups (children of low PIF parents) did not.

3. In reading comprehension at School A and mathematics at School B, the performances of children whose parents were highly involved improved significantly over the performances of the respective control groups.

4. The parents of children at both schools showed:
   a. an overall improvement in general educational attitude and interest;
   b. considerably more interest of a practical nature in their children's schoolwork; and
   c. a greater understanding of curriculum method and content.

5. In a number of cases, an improvement in parental attitudes was accompanied at both schools by an improvement in school performance, and a regression in parental attitudes by a decline in school performance.

Reflections

But it would be improper to measure the value of this kind of cooperation in statistical terms alone. In the end it is the effect it has on teacher-parent-child relationships which perhaps matters the most. From the teacher who was caught up in a rising tide of 'infectious enthusiasm' from his class, to the mother who was coaxed out on to the swamps during the summer evenings by her small daughter to catch eels with her bare hands, unanimity prevailed. There was no doubt in their minds of the value of the exercise.

But what does all this mean to the average headteacher, perhaps already hard-pressed with staff shortages, classes still too large and a half-completed swimming pool at the bottom of the playing field as well? Quite simply this. The power-source of the parent extends far beyond those boundaries of involvement in the school which have been traditionally accepted in the past. If any teacher publicly shows confidence in the parents' ability to make a useful contribution to the class curriculum, then he will be well on the way towards the forging of a new and mutually beneficial working relationship between the three members of the educational triangle.

'The teaching pattern', Professor Halsey has said, 'should be a triangle, with a teacher, child and parent at each corner, and with the learning-teaching arrows moving between each and every pair'.

Figure 1.

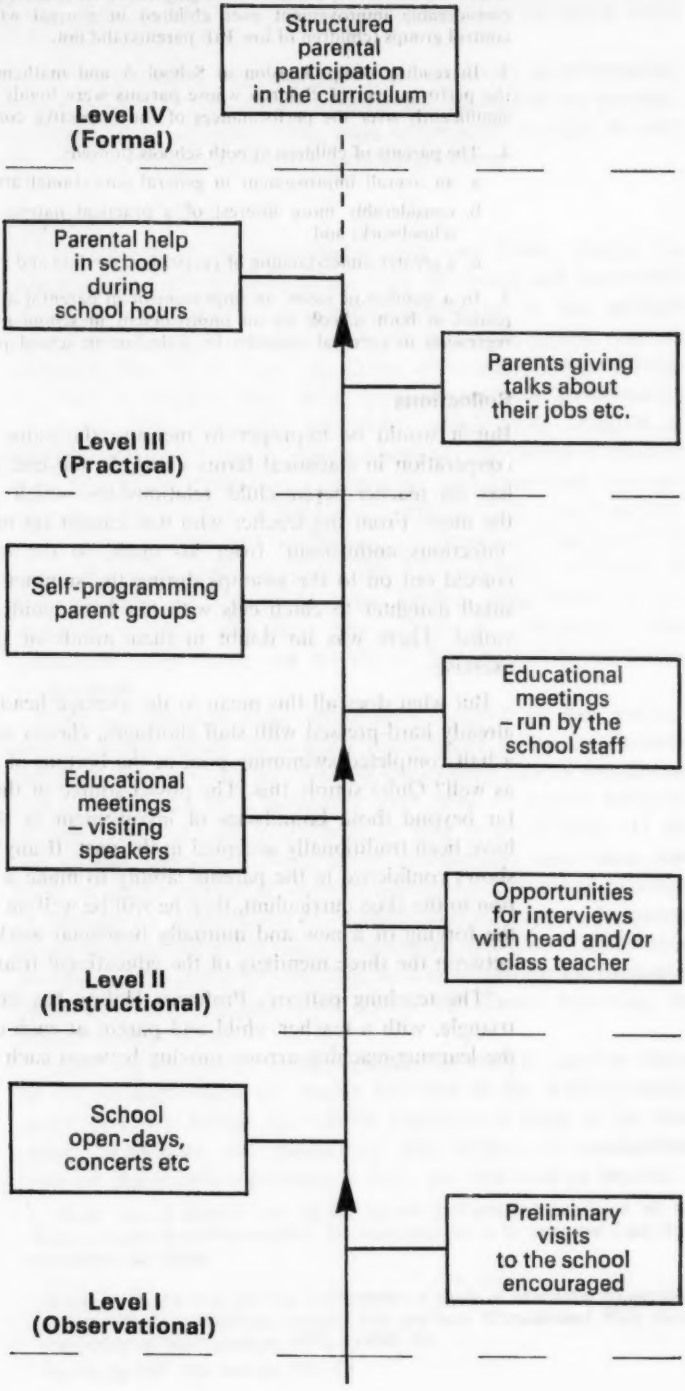

Structured parental participation in the curriculum
Level IV (Formal)
Parental help in school during school hours
Parents giving talks about their jobs etc.
Level III (Practical)
Self-programming parent groups
Educational meetings – run by the school staff
Educational meetings – visiting speakers
Opportunities for interviews with head and/or class teacher
Level II (Instructional)
School open-days, concerts etc
Preliminary visits to the school encouraged
Level I (Observational)

Figure 2.

1. To find out and sketch some examples of tessellations in the home.

2. To find out how water, gas and electricity is distributed around the home.

3. To take rubbings of objects found inside or in the vicinity of the home.

4. To find out as much as possible about different kinds of wheels and make some drawings or a collage.

5. To put the teams of a football league into alphabetical order.

6. To record the weights of different grocery items found in the kitchen, in both ounces and grammes where possible.

7. To do a short piece of writing on 'Being tidy'.

8. To look at pieces of pottery in the home, find out the makers' names, where they were made, and how far the potteries are from the school.

9. a. To look for signs of spring in the countryside or garden.
   b. To make a drawing to scale of three small objects in the home.

10. To find an animal's footprint, draw it and then make a design using the print as a monoblock.

11. 'Look Around You' competition. (Locally orientated quiz. Two weeks allowed.)

12. To make a sketch map of the area immediately around the home.

13. To make a book of tens and tenths.

14. To find three plants in the garden, draw them and identify them.

15. To make a list of the different types of workmen seen working over the weekend.

16. To collect various types of lettering from magazines and newspapers and mount them on paper.

The achievement of the FE college

What has further education achieved, and what is its role to be in a rapidly changing society?

R. M. PRIDEAUX

R. M. Prideaux is an HMI in the Midland Division; his responsibilities lie in further education

There is an historical connexion between technical education and technical change. It was the onward march of technical invention and economic growth, the elaboration of industrial processes and manufacturing techniques, which made it necessary to organize, for those who had only an elementary or academic education, opportunities to acquire skills and a knowledge of science and mathematics in their applications to working problems and situations. Only very slowly were science and technology admitted as normal 'subjects' in secondary education. The technical colleges built between the world wars were essentially innovatory in relation to the more traditional provision of secondary schools, and were from the start concerned to respond to the changing needs of an evolving industrial and commercial society.

How further education developed

One of the innovations of the Education Act of 1944 was the concept of further education as a continuing process to follow the end of full-time schooling, although it may still be a long way from fulfilling all its promise. The concept of universal continuing part-time education until the 18th birthday was both imaginative and realistic, as we now know from seeing the social consequences of leaving what the Central Advisory Council for Education referred to as 'half our future' adrift during the most formative, and therefore the most vulnerable, period of adolescence. If every young person between 15 and 18 had been in tutelage for a day a week over the past 20 years to an adult professionally trained and selected to assist his or her personal development, we should at least be much nearer to a reliable applied sociology of adolescence; we should be much better informed about the real needs and frustrations of working class youth in the 'unexaminable' bracket; and we might even have begun to construct a youth culture less alienated from adult society and less fragmented into a medley of incompatible sub-cultures. As far as this half of our future is concerned the further education college is the innovation which did not materialize.

Further education developed most strongly in the fifties and sixties in the form of technical departments, first engineering, applied science and building, then commerce, business studies and catering. The shift from evening classes to the great expansion of day release (later block release and sandwich) courses was in itself a significant innovation. It changed the life style of all the young people who no longer had to sacrifice so many evenings of their own time to acquiring skills and qualifications. They now met daily in institutions increasingly built, equipped, organized and staffed to provide them with programmes designed specifically to meet their vocational ambitions, or their presumed vocational interests. In time came refectories, common rooms and libraries, gymnasia and sports fields. There also came the recognition that 'general education' continued after leaving school.

General education for the part-time technical student must be regarded as an important curricular innovation made possible by the great organizational change from evening classes to day or block release. Enlightened managers of large enterprises understood that if the wider interests of their work force could be developed they stood a good chance of having fewer frustrated and resentful employees and, in time, a better informed and so more responsible cadre of shop stewards and trade union organizers with whom to negotiate. 'General studies' have been a rather variable component in the educational programmes of part-time students but there has certainly been much innovation; and much of value has been learnt about what is appropriate or acceptable to young men and women between the ages of 15 and 20 who are independent wage earners and who normally do not wish to be patronized, proselytized or politicized. The most successful programmes of general studies have contributed significantly to curricular innovation in the secondary schools, as indeed have many of the technical subject programmes.

A very wide range of new courses for craftsmen and technicians have been promoted by enterprising technical teachers during the past twenty-five years. The examinations of the City and Guilds of London Institute have contributed notably to the innovatory process, as have those of the Joint Committees of the Professional Bodies. Continuous assessment has been a feature of the National Certificate schemes since they began 50 years ago, and teacher involvement in the examination of technical students was widespread long before the introduction of CSE with modes 1, 2 and 3. It cannot be claimed that innovation in teaching methods has always kept pace with innovation in syllabus construction or examining, although the development of 'projects' was stimulated by the need for greater emphasis on practical tasks to be designed and executed as a test of skilled craftsmanship.

Some of the most striking innovations in education have arisen in those institutions which have developed into colleges of advanced technology, technological universities and polytechnics. Poly-

technics already show signs of innovating in a number of curricular and organizational modes, in their styles of teaching and assessment, and in their willingness to accommodate themselves to a variety of life styles other than those of the full-time student mainly dependent on his family or on a local authority grant. It is likely that in time the innovations of the higher further education sector will exert increasing influence over the programmes offered to the 16–19 age group in colleges and schools.

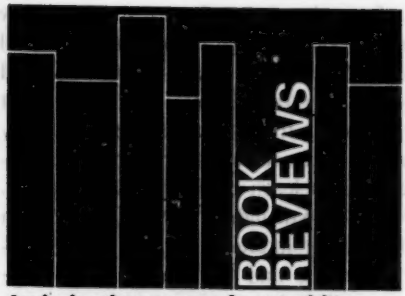
One of the most striking developments on the further education scene since the late fifties has been the steady growth of full-time education. This began most commonly with commercial courses for girls who wished to qualify as shorthand typists. In many cases they needed more general education, and the office arts rarely occupied more than half the timetable. When the secondary modern schools developed from the 1944 Act discovered that their 'top stream' were as capable of getting three or four O-level passes as the 'bottom stream' of the grammar schools, and that parents and pupils demanded an opportunity to show what they could do, this demand was most conveniently met for a number of years in further education colleges, in a variety of organizational patterns according to local circumstances. Inevitably, this growth of GCE studies at O-level was followed by an expansion of A-level studies. At the same time the Ordinary National Diploma courses were introduced for each of the main technical fields—engineering, business studies, construction, and so on. By the early seventies the FE colleges had become major providers of full-time general, technical and 'pre-professional' education for anyone between 16 and 60.

The college and social innovation

The college of further education is a major innovatory social mechanism with undefined educational objectives. It is capable of responding with new organizational forms to new educational needs. It can offer programmes on an intensive short-course basis or an extensive long-term basis. It can provide lecturing, library resources, programmed learning for individual needs, group discussion and demonstrations, seminars and tutorials, social and industrial experience and observation, vocational guidance and counselling, and remedial programmes of basic education regardless of age or cultural background. It can do all these things, but few colleges are doing all of them, and some are notably unenterprising. Curricular innovation does not keep pace with new forms of educational programming, particularly in the more traditional technical courses and in GCE O and A level examination work.

The college of further education has already become in some communities a general adult education institution with a core of vocational courses. What is defined as 'general' or 'vocational' varies with social and economic change; it is partly a matter of subjective judgement and partly a matter of administrative con-

venience. If large numbers of people need to be retrained for new occupations in middle life, a training opportunities scheme will naturally look to the colleges for substantial assistance. If paid employment has eventually to be rationed because there is not enough of it to go round, training for leisure occupations may become a major pre-occupation of the formerly vocational departments. More people may choose to learn technical skills for fun. 'Do it yourself' is likely to be a growth industry. Men and women will have eventually to balance their interests as citizens and taxpayers, as consumers and spenders, and as workers and wage earners. The further education college is in some respects a microcosm of these conflicts where the taxpayer meets himself either as a worker acquiring new skills or a consumer acquiring new tastes.



An induction course for teaching in further education and industry
Patricia MacMillan and Len Powell
Pitman £2·80 (£1·50 in paperback)

If learning should be autonomous and continuing it is at any rate open to argument whether there is a need for books such as MacMillan and Powell's. It is the student's part of a 'multi-media learning package' intended to provide the trainee with a how-to-do-it-kit for teaching in the space of four weeks. Its arrangement is admirably clear and logical. Within its own terms of reference it appears to have only three weaknesses. Its potted account of learning theories, even within the stated limits, is quite inadequate as an introduction to adolescent and adult learning; indeed, the book pays very little attention throughout to learning as opposed to teaching processes and events. Linked with this is the virtual absence of any notion that learners in further education and industrial training are very varied people who have a great deal of experience of life, of relationships, and of subject matter in which their new learning is an extension which should build upon what they have already learned and experienced. Finally, it seems questionable whether the preparation of learning packages (which makes up the last quarter of the course) is not too ambitious an addition when some fundamentals are lacking. But the major question is whether it is sound and proper in any form of teacher training to rely upon a how-to-do-it-kit. Its effect must inevitably be to introduce a vast subject in a stereotyped form. A comparison, for instance, with the BBC's *Adults in education* (ed. J. Rogers) points the moral. One aims at opening up concepts and relating them to skills, while the other packages information and implants drills.

When the vicar of an impoverished parish coupled expressions of surprise with his thanks to an elderly Quaker for a cheque in aid of his organ fund, he received the reply, 'If thee must worship with machinery, have good machinery'. Apart from the weaknesses which have been mentioned, this seems likely to be a very competent piece of machinery. Whether there is a place for it depends on one's conception of what education is about. K.T.E.

A first language: the early stages
Roger Brown
Harvard/George Allen and Unwin £5·95

This study will eventually cover five stages of language development in a series; this volume, dealing with two of the stages, is the first.

The core of the book is concerned with the language development of three children—Eve, who was 18 months when the study started, and Adam and Sarah, both of whom were 27 months old. The procedure was for at least two hours a month to record the speech of these three children and then to analyse it. The analysis was laborious and could not be done by coding the sentences for grammatically significant features and putting them into a computer because, as the author says, he was never sure what the full coding would turn out to be.

The author summarizes some of his guesses as to what generalization 'with their implicit prophecies' might be made. He says that the order of progression in knowledge of the first language, both semantic and grammatical, will prove to be approximately invariant across children learning the same language, and, at a higher level of abstraction, across children learning any language. He remarks that the primary determinant of acquisition order will prove to be cumulative complexity, both semantic and grammatical,

and that the rate of progression will vary radically among children. Minor determinants of order of acquisition will be frequency and perceptual salience. He comments that what impels a child to 'improve' his speech at all remains something of a mystery — 'surely the improvement is a response to selection pressures of various kinds'. These very modest conclusions at the end of 437 pages recording such a detailed and exhaustive study of the children and their language may, in fact, give the reader a sense of anticlimax. This would, however, do less than justice to what has clearly been a very thorough conducted research on a limited number of cases. It is unfortunate that the book is rather heavy going, for the path to understanding language development must surely depend on studies of children talking.

C.A.N.

The government and management of schools

G. Baron and J. G. Howells

Athlone Press £4·50

I read this book with considerable interest and sympathy. It recounts the results of a complex investigation of the difficult, yet significant, area of participation in educational administration and management, and the results are presented with commendable clarity and directness. Yet it is necessary to submit that this research may not in the end do much to help clarify current issues and solve important policy and decision-making problems concerned with today's schools and school systems. The reasons can be stated quite starkly:

a. The institutions have become so complex as organizations, communities and, in their interactions, as systems or networks of educational provision that even their own managements internally, let alone outsiders in administration and government, have the most serious difficulties in knowing, understanding and controlling what is going on inside them. This is not to say that I consider them unmanageable, as the current vogue has it—quite the reverse; they need and deserve highly skilled and sophisticated professional management of a new kind if they are to realize the advantages of scale. This I believe is susceptible of training.

b. There is still no fundamental concept, even after this research, of what school government is really for. Most articles of government are legalistically defined, and that in terms of small scale controls and procedures in no-development contexts.

c. The framework for the research—sponsored in 1965 for the Royal Commission on local Government in England and Wales—was, naturally, not geared to deal with the institutional situation of the mid 1970s—and the problems we shall experience in large school and system management and administration, particularly in terms of the growing significance of links and relationships with outside agencies will not have been foreshadowed, still less illuminated by this research.

This is obviously complaining too much. I readily admit to writing these lines in some alarm over the applicability of research to such prospective problems as this will have indicated in the technicalities and complexities of educational administration. The outcome of Baron and Howells's investigation therefore should not really be judged in this context; in its own context it is of much interest and certainly will provoke thought; in these terms it deserves recognition.

P.C.W.

Equal opportunity in education

Harold Silver (editor)

Methuen £3·60 (£1·80 in paperback)

Another reader in education, and this time the topic is topical. Fashions have swung backwards and forwards the last quarter century between quality and equality. The latter is gaining ground again, and the talk today is not so much equality of opportunity as opportunity for equality. It is useful to have some of the main literary landmarks set up, starting with Tawney's seminal essay in 1922 to introduce 'secondary educa-

tion for all' and leaving the tale with Halsey and 'educational priority'. In between is a large section headed 'selection under attack 1948–67'. The editor (reader in educational history at Chelsea) provides a handy summary for each section. Most college libraries will have most of the originals but for students who like the key passages in one cover the paperback at any rate is good value. N.C.

The school: an organizational analysis
Stephen J. Bennett
Blackie £1·20

Pastoral care
Michael Marland
Heineman £3·50

The school: an organizational analysis is justly presented as an introduction to the analysis of schools as organizations, the subject of the author's recent research. To note that the book suggests wider experience of Scottish than of English schools is not to detract from its interest to English readers; but the organizational structures as described hardly take account of English development, and the simplicity of the models is occasionally limiting and perhaps misleading. However, this is a useful primer, even for the experienced: the organizational categories are lucidly applied to schools, and the functions of school management precisely defined in similar terms: relations with the environment; goals and policies; organizational structure; control through coordination and communication.

The sub-title of *Pastoral care* is 'Organizing the care and guidance of the individual pupil in the comprehensive school'; like others in its series, it aims not to prescribe but to explore the practical possibilities of organization. The editor and major contributor is head of a London comprehensive; five of the 12 chapters are contributed by experts in particular fields. The book consists of discussions of major topics in the organization of pastoral care inside and outside the school, case studies of pupils and organizations, and a concluding chapter which supplements previous sections. The intended readership are heads and senior staff, pastoral heads and workers in related fields, including administration.

This book makes a notable contribution to the study of school organizational structures. Its principles—that concern for the total welfare of the individual pupil is the central task of the secondary school, and that the function of organization is to encourage collaboration of staff and reciprocity in the relations between teachers and pupils—are based on mature experience and expressed with conviction. The book examines some important organizational issues, and its balanced and perceptive analyses of the social and cultural contexts, groups and groupings, the scope of the responsibility held by heads of year or house, and the continuum of importance attached to the role of tutor, will provide a conceptual framework for schools to examine the suitability of their own systems. It is a pity, perhaps, that more space could not be found to discuss the problems of preoccupation with 'crisis' pastoral care, and teacher-time as a factor in determining both the goals of pastoral work and the balance between teaching and non-teaching functions of staff.

The topics of 'careers guidance' and 'internal communication and records' seem worthy of a rather more integrated treatment than is possible in the concluding chapter, but in general the arrangement of the 'semi-symposium' combines coherence with variety and interest. The annotated reading list provides an informative guide to further study of pastoral care. If the book tends to assume the large 11–18 comprehensive school, the blend of personal experience, impressions of other schools, general reading, and use of research evidence enhances the acceptability of a book which deserves a warm welcome from all concerned. P.F.S.

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